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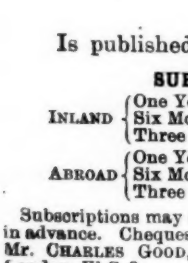

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BY CHARLES S. MYERS, M.D., SC.D., F.R.S.,
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No medical officers have felt the strain of war more severely than those engaged in the treatment of functional nervous disorders. Both in this country and overseas their time and energies have been so fully occupied that any systematic research in their special sphere of work has been generally out of the question. But now, perhaps, this tension may be relieved; and inasmuch as, even at this late hour, it is still possible to investigate various problems which have arisen during the past four years, I have endeavoured in this paper to draw attention to those which seem to me of the greatest importance. If, perchance, there be any who have relevant data which are too scanty to be published separately and would otherwise lie hidden away in note-books, I shall be happy to receive them, and will, of course, be careful to acknowledge their source in any compilation which can be usefully made from them.

ETIOLOGY.

There is a general agreement that the war neuroses are to be regarded as the result of functional dissociation arising from the loss of the highest controlling mental functions. Yet considerable controversy exists as to how those controlling functions are lost, and precisely what occurs when they are lost. Some, for example, consider that functional nervous disorders are dependent on increased suggestibility arising from fear, horror, or other emotional or fatiguing conditions; while others maintain that, quite apart from suggestion, emotional conflict or excitement is capable of producing functional disorders. Some have distinguished a so-called commotional from an emotional syndrome; others have insisted that whether a man has been buried in a trench or has seen his best friend's brains scattered before him the functional symptoms are identical. All now agree that mere concussion or the poisonous action of carbon monoxide or other noxious gases does not necessarily give rise to functional nervous disturbance.

Many neurologists hold that the effects of suggestion and of functional disturbance are limited to phenomena which can be imitated voluntarily by the patient; they accordingly limit functional disturbances to those which can as well be produced by malingering. Hence local or general sweating, vaso-motor disturbances, changes in the reflexes or in muscular tone, and any disorders of movement which do not disappear during sleep or under an anæsthetic cannot, according to this view, be due to suggestion and cannot be classed as functional disorders.

But cases of contracture occur which clearly cannot be imitated voluntarily[2]; so do, more seldom, cases of spasmodic movement and of incoördination. The persistence of contracture or of spasmodic movement is likewise inimitable by volition. Moreover, every physician of experience must have met with patients suffering from functional deafness, whose sleep has not been in the least disturbed by the loudest noises, and they must have seen contractures and spasmodic movements persisting during sleep and during at least the first stages of chloroform anæsthesia. We may recall the case of persistent contracture described by G. Ballet,[3] which was carefully tested during sleep by means of stamp-paper gummed to the affected region.

It has, however, been objected that in such exceptional cases of contracture the possibility of joint adhesions has not been considered, or that the contractures are due to peripheral causes and are therefore to be placed in a special group of "reflex contractures." In this country, at least, I think it difficult to exaggerate the harm that has arisen from an uncritical acceptance of Babinski's hypothesis of "reflex" paralysis or contracture. I have met with expert neurologists who, on diagnosing a case as belonging to the "reflex" group, have at once regarded it as "organic" and have refused it admission to one of the special hospitals for functional disorders. For my part, I have never seen such a case in which the paralysis or contracture has not been cured by psycho-therapeutic measures (aided, sometimes, by manipulation under an anæsthetic), and the other so-called reflex symptoms (loss of muscular tone, coldness, sweating, &c.) have not disappeared *pari passu* with the regain of normal voluntary movement.

Chief Topics for Investigation.

There are, then, three main topics for investigation: (1) the existence of distinct commotional and emotional syndromes; (2) the justification for limiting the effects of suggestion to volitionally imitable phenomena; (3) the sufficiency of suggestion as an explanation of all functional dissociation.

Of these the first merely requires the collection of observations. My own experience is that in patients who have been exposed to physical violence (i.e., having been buried, knocked over, or lifted in the air), stupor, hyperæsthesia, and spasmodic movements are commoner than in those whose disorder has a purely mental origin. If these differences are confirmed by others their explanation would not be difficult, but at the present moment would be out of place. So, too, it would be inopportune here to consider whether a special kind of commotion—e.g., a fine "molecular" commotion, such as might be produced by moderately short waves of the disturbed air—may ever be directly responsible for functional disorder, producing dissociation through its exhaustive effect on the higher "intellectual" regions or through its excessively stimulant effect on the lower "emotional" regions. In passing, we may note that emotion alone can give rise to increase of pressure and of albumin content, and even, according to some, to leucocytosis in the cerebro-spinal fluid. But fuller observations are needed on this matter.

The second topic suggests a variety of investigations. Can suggestion produce local pallor or blushing? Most experts in hypnosis maintain that local disturbances in blood-supply can be induced by hypnotic suggestion. Some claim even to have produced blisters, but further work under the careful conditions adopted by Captain J. A. Hadfield, R.A.M.C. (then a naval surgeon[4]) is urgently needed. Similarly in regard to local sweating, &c.

The third topic involves the consideration of the other causes, besides suggestion, which have been advanced as responsible for functional dissociation. Some have thought that an excessive emotional experience may suffice to bring it about. Others have laid stress on the repression of an emotion or instinctive action arising from its conflict with other antagonistic processes, especially with the higher motives of conscience, social sanction, &c. Particular stress has been laid on the conflict of "wishes," on maladaptation to environment, on the fear of death, and on defence mechanisms before an intolerable situation; the object being to bring all the war neuroses under two heads—the "conversion hysterias" and the "anxiety neuroses."

Classification of Main Types of War Neuroses.

With a view to determining the sufficiency of suggestibility as a cause of functional nervous disorders, let us endeavour to classify the main types of the war neuroses, beginning with obviously hysterical, "suggested," cases and passing to those which show more and more clearly the need for other explanations.

1. A highly "nervous" soldier is hit on the forearm by a piece of shell. His arm drops to his side, and the thought at once occurs to him that he has lost the use of it. The entire limb becomes functionally paralysed. Here we have a clear case of suggestion acting under the influence of fear.

2. After an accident in civil life a man had long ago suffered pain or impaired mobility. A slight bruise in the same region on the battle-field produces functional hyperæsthesia or paralysis. The hyperæsthesia gives place to anæsthesia, or with recovery of movement a condition of extreme incoördination ensues. The influence of suggestion

[1] Four previous communications on this subject appeared in THE LANCET of Feb. 13th, 1915 (p. 316), Jan. 8th (p. 65), March 18th (p. 603), Sept. 9th, 1916 (p. 461).

[2] Cf. Roussy: Rev. Neurol., 1912, xxv., p. 204.

[3] Ibid., 1915, xxii., p. 767.

[4] THE LANCET, Nov. 3rd, 1917, p. 678.

is here fairly obvious. The soldier may even admit that the bruise revived the memory of his former accident. But is it necessarily and always true that hyperæsthesia has been converted into anæsthesia by suggestion or that the incoördination can be imitated volitionally?

3. In childhood certain spasmodic movements were temporarily induced by a severe fright. Of this the soldier has lost all memory. Sudden fear in the trenches revives this disordered movement, which persists for many weeks. The influence of suggestion is here less sure. But even if suggestion can explain the origin it cannot account for the long persistence of the movement, which may even continue during sleep. But if (as is usual) it ceases during sleep can it be supposed that each morning on waking the patient receives a fresh suggestion? Do we not gain a clearer insight into the condition by regarding the movement as a dissociated emotional expression inherent in the waking personality of the patient, especially when this view leads us to cure the disorder by reviving in the patient the memory of the original trouble, and thus helping to restore his normal personality?

4. A soldier in previous good health is buried owing to a shell explosion. After a period of stupor or confusion (perhaps preceding, accompanying, or following excitement, depression, or fugue), he "comes round" mute and amnesic, but he has clearly not quite returned to his normal self. Here there is no evidence of suggestion, but it is possible that suggestion may have influenced the patient when the state of confusion or stupor was passing away. By means of hypnosis memories of a patient's thoughts or environment during confusion or stupor may often be recovered. Hypnotic investigation may therefore serve to clear up this point. Yet even if loss of speech had been suggested during recovery from confusion or stupor, suggestion is impotent to explain such a patient's loss of memory. The soldier may confess to having felt some previous fear, but what man has not at some time had that experience in the trenches? There is often no evidence of any mental conflict before or after burial. But he may have been unconsciously repressing some tendency to action. Here hypnosis may again prove of use in revealing the presence of such past conflict or inhibition. It cannot be said that mutism and amnesia are obvious measures of escape from the firing line; and amnesia can only be called a defence mechanism in the sense that, like stupor, it safeguards the patient from suffering further emotion. In such cases, may we not suppose that the shock of an excessive emotion (or ? commotion) is adequate to produce an abnormal, stuporose, or confused personality, on emergence from which the memories of events relating thereto are necessarily lost, mutism persisting as a piece of dissociated behaviour expressive of the mental disturbance?

5. A soldier suffers pain in one or more limbs consequent on burial or a wound; or the application of a splint to his wounded limb results in prolonged immobility. He gradually develops a functional condition of muscular contracture or paralysis. There is no evidence of suggestion here. The patient is usually quite unable to account for the onset of his condition, but more careful mental exploration[3] in the waking or hypnotic state is likely to throw light on the matter. Without this exploration all such facile explanations as the wish to escape from an unpleasant situation, the habitual persistence of immobility, the desire for a pension or for discharge from the Army, are scientifically worthless.

6. A soldier has for several months been suffering from self-reproach, owing to some act he has committed; subsequently he develops a functional disorder. For instance, he has shot at the uplifted arm of a surrendering enemy, whose arm drops helpless as he falls to the ground; later the patient's arm is slightly injured, and it becomes completely paralysed. Or he has long worried over past sexual abuse; and on breaking down from the strain of warfare he develops washing-like movements of the hands, symbolic of ridding himself of his impurity. Or he has reproached himself with causing the death of a comrade; and on breaking down he begins to suffer from visual hallucinations of seeing an avenging finger pointing at him, or from auditory hallucinations of hearing an accusing voice, or from the conviction that he has sinned unpardonably, &c. Suggestion is powerless to account for these various examples of loss of control over bodily or mental processes. They are clearly the result of imperfectly solved conflicts, the more or less repressed, dissociated complex finding expression in motor, sensory, or ideational disorder. For with the exploration of their origin, their explanation to the patient, and his increasingly successful efforts to face and to solve the conflict his troubles come to an end.

But even if we admit that suggestion may act on the involuntary nervous system, that suggestion plays but a small part in the causation of the war neuroses, and that extreme emotion and conflicting complexes are by far their most important determinants, there still remains for consideration to what neural level functional dissociation may extend.

LIMITS OF DISSOCIATION.

Cases frequently occur in which the sudden recovery of lost memory is accompanied not merely by the restoration of speech, not merely by the cessation of spasmodic movements, but also by a marked change in the entire facies of the patient. He not only (as he states) feels, but he also looks, another person. His pupils, pulse-rate, and skin colour regain their normal condition. We may consider their previous abnormal state as due to the persistence of emotional expression, either uncontrolled by, because dissociated from, the normal personality, or belonging to an "ultra-emotional" personality which held sway owing to dissociation of the normal personality.

In the third of these contributions I suggested the general resemblance of certain cases of functional hyperæsthesia to the features of disordered sensibility described in cases of thalamic over-action, where the optic thalamus has been cut off from the normal control exercised by the cerebral cortex. Can the effects of loss of higher control in the war neuroses be similarly manifested in disorder of the sympathetic and reflex systems?

As a rule, the nystagmus, clonus, and rombergism observed in functional disorders are clearly distinguishable from those occurring in organic cases. The nystagmus is rather of the nature of an unsteadiness, the clonus is only obtained at a particular angle of flexion or degree of tension, the rombergism disappears when the patient's attention is distracted from the fear of falling. But everyone with sufficient experience must have occasionally seen cases where these disturbances in a clearly functional case are indistinguishable from truly organic disorders, just as a so-called hysterical convulsion may occasionally be indistinguishable from one due to so-called idiopathic epilepsy.

It is a question of what neural levels may be involved as the result of functional dissociation and loss of control. In his zeal to limit the manifestations of "pithiatism" to the sphere of volitional activity Babinski refuses to believe that the patellar reflex can ever be exaggerated in the functional neuroses; and neurologists holding such views delude themselves by using the epithet "brisk" in place of "exaggerated." But will any dispassionate observer deny that in the war neuroses the knee-jerk can be as exaggerated as in disseminated sclerosis, at the outset of which, by the way, we may recall the appearance of various "functional" disturbances?

The Plantar Reflex.

Let us consider in similar fashion the plantar reflex. In many cases of war neurosis no response is obtainable, or an extension of the toes may result from plantar stimulation, especially when there is well-marked hypertonus of the extensor muscles. Often this extensor response is clearly of a voluntary character, and is associated with strong flexion at the ankle; but in some cases, especially, of course, where the disturbance of consciousness has been severe after burial, a temporary extensor response may be obtained which is indistinguishable from one resulting from organic interference with the pyramidal tract.

The appearance of the extensor response at the close of an epileptic convulsion can only be due to a temporary loss of higher control arising from exhaustion of the inhibiting paths. May not such loss of control sometimes as well arise through functional dissociation? A case has been recently reported to me where the emotional excitement consequent on the revival, during hypnosis, of terrifying repressed incidents of trench warfare, produced a temporary extensor plantar response.

[3] I prefer the term "exploration" to "analysis," alike because it is more exact, and because it does not imply adhesion to any special "school."

Clearly, further investigation of the plantar response under these and other conditions is urgently needed. In many cases of asymmetric plantar reflex I have found that on the side on which the flexor response is weaker or absent, the knee-jerk and the abdominal reflex are also weaker than on the opposite side, and the cutaneous sensibility is also diminished.[6] Sometimes this association is reversed. These were all purely "functional" cases. Here, again, we need further observations.

Hypothesis of "Reflex" Origin of Certain Disorders.

It is easy to hold to the clear diagrammatic view that all functional neuroses are confined to disturbances of volitional activity, and that where disorders of the reflexes or of the vaso-motor system occur, or where sweating, muscular hypotonus, hyperexcitability, &c., arise, they stamp the case to be one of Babinski's "reflex" cases. Such a simple view, like the old conception of aphasia, overlooks many difficulties. For instance, the so-called reflex phenomena are usually limited to the hands or feet, whatever the site of the wound; they may occur in patients who have not received any wound at all; they are very rare in wounded patients who show no signs of paralysis or contracture; the contracture or paralysis is always amenable to psycho-therapeutic methods. That the vaso-motor and other disturbances do not disappear as rapidly as the paralysis or contraction is no proof that they are produced by reflex causes.

Babinski and Froment have observed[7] that the abolition of the plantar reflex, the muscular and nervous hyperexcitability, and the slowness of contraction, characteristic of their "reflex" cases, are closely associated with hypothermia. Warming the affected limb abolishes these abnormal conditions. But this is no proof that they are of "reflex" origin. It will be recalled that after the division of afferent nerve fibres in his arm, Head found that a cold day would throw its state back several weeks; the just-reacquired epicritic system was depressed, leaving the more primitive protopathic system alone in activity. That is to say, higher and more recently acquired systems of sensibility and reaction are prone to be inhibited or dissociated by cold and to be redintegrated by warmth.

Babinski and Froment have also observed[8] that in their "reflex" cases of paralysis and contracture chloroform anæsthesia often causes at a certain stage an exaggeration of the tendon reflexes and a well-marked clonus on the affected side, while in healthy people they fail to get any similar appreciable effect. But these observations on the effect of chloroform anæsthesia, as well as those on the effect of warmth on the reflexes, need to be carried out on purely functional cases where there can be no question of "reflex" causes.

Theory of Loss of Some Higher Control or Endocrinic Disturbance.

If we discard the hypothesis of the "reflex" origin of these disorders what explanation can we offer in its stead? On the one hand, we may regard them as consequent on the loss of some higher control, due to emotional disturbance, in which case their limitation to a single region is due to the same cause as the limitation of the voluntary muscular paralysis or contracture. Or, on the other, we may regard them as immediately due to some disorder of the internal secretions, in which case their localised manifestation may be attributed to a local nervous predisposition, either congenital or acquired. Thus, Babinski and Froment[9] have described certain cases of "reflex" disorder in which a smaller pulse was observed on the affected side. But d'Oelsnitz and Boisseau[10] find that the pulse is small in such cases on the unaffected side also, and they regard the inequality as merely the accentuation of a constitutional or acquired disposition. Boisseau[11] observes that after cure the previously smaller pulse (on the affected side) may become larger than that on the opposite side, as the limb becomes warmer and less cyanosed. Clearly further investigations are needed on this subject.

But in either event, whether the so-called "reflex" phenomena are due to loss of higher control or to endocrinic disturbance, emotional disorders are fundamentally responsible for the condition. It only remains to determine by investigation whether these neural disturbances are produced directly by the emotion or indirectly through the action of the "emotional centres" on the endocrine glands. The one reliable method of determining whether there is any disorder in internal secretion would seem to consist in ascertaining if the patient is unduly susceptible or insensitive to doses of the various glandular extracts, the normal effects of which have been observed by control experiments on healthy persons.

I recall two cases of "shell shock" lying side by side in a clearing station in Flanders. I drew a cross with my finger on the abdomen of each, and obtained in the first a vivid *tache cérébrale*, bright red in colour, while the second yielded an equally vivid image of a cross in white—a phenomenon now recognised to be due to arterial hypotension, such as may arise from adrenal insufficiency. Here, then, conceivably we have two patients respectively suffering from an increased and a diminished tone of the sympathetic system, associated with hyper- and hypo-adrenalism.

In a series of cases examined by me within a few hours after the onset of "shell shock," I could find no sphygmomanometric evidence of increased blood pressure, nor by Fehling's fluid could I detect (save in one case) the slightest trace of sugar even in the first urine passed by these patients since they left the trenches. But sympathetic (or vagal) neuroses may be associated with glandular exhaustion, as well as with glandular over-action.

We need a careful record of the effects of glandular extracts on the emotional condition of cases of war neuroses, and of their effect on the psycho-galvanic reactions and on the reaction times of such patients in association tests.

We are as yet uncertain of the range of action of the sympathetic system, and hence of the extent of its influence in the war neuroses.[12] That it can control the tone of voluntary muscles and affect the steadiness of their contraction there is little doubt. Can it also produce the osteoporosis and muscular atrophy which is observed in many so-called "reflex" cases? Every experienced physician must have occasionally met with a surprising degree of atrophy, alike in cases where there has been some local wound or central concussion and in cases where there has not. This atrophy is often very slow to disappear and in the experience of some is intensified by the returning use of the affected muscles. In certain cases it may arise from vaso-motor disturbances in the cord, induced by the sympathetic system. In addition to the collection of data bearing on this obscure subject we need a series of investigations by modern methods on the electrical reactions of functionally disordered muscles.

In this country, at least, we have been paying so much attention to the mental aspect of the war neuroses that a detailed examination of the accompanying bodily symptoms has been generally neglected. We have yet to ascertain what symptoms usually occur in combination. My own experience, for example, leads me to think that a feeble or absent plantar response is usually associated with a sluggish reaction of the pupils to light and with a tendency to clonus and catatonia, while an unusually brisk flexor plantar response is associated with an extra-active pupil reaction. Rigidity of the limbs often seems to go with hyperæsthesia, weakness with anæsthesia. But much more information is needed on this subject.

A more careful study is also needed of the mental and physical changes occurring during recovery. A most promising subject of investigation would be the changes that terrifying dreams undergo as the patient improves—victory, perhaps, replacing defeat in his dream battles, and civil elements gradually intruding into the dreams of warfare.[13]

TREATMENT.

Those who have had most experience in war neuroses are generally agreed that different physicians attain different degrees of success according to their particular mode of use of the same treatment, and that there is hardly any form of treatment recommended that has not its value in appropriate

[6] Cf. Dejerine: Rev. Neur., 1915, xxii., No. 19.
[7] Hysteria or Pithiatism (Eng. trans.), 1918, pp. 137, 148, 243, 254 ff.
[8] Op. cit., pp. 97, 152, 253.
[9] Op. cit., pp. 126, 261 ff.
[10] Rev. Neur., 1918, xxv., pp. 202 ff.
[11] Ibid., 1917, xxiv., 289.
[12] In agreement with Pighini (Riv. sperim. di Freniat., 1917, xlii., 298), Orr and Rows have pointed out (Brain, 1918, xli., 19) how intimately the sensori-motor and psychic areas of the cerebral cortex are associated with the sympathetic system, and hence how disordered functional activity of the former may spread through the latter to lower centres in the mid-brain, bulb, and cord, causing dilatation of the pupils and cardio-vascular and other disturbances.
[13] Cf. D. E. Core: THE LANCET, August 10th, 1918, p. 169.

cases. Nearly all of us have learned to ban the routine use of hypnotic drugs; yet in some cases they are unquestionably valuable. An unbiased record is needed of such successes and failures. So, too, we have learned that it is usually disastrous to send a patient to employment or amusement in the hope that he may forget all his worries and solve his conflicts by neglecting them. Yet in some cases this treatment is successful. Again, therefore, we require a careful record of the special determinants which should guide our adoption of the policy of sending mentally uncured neurasthenic cases out of hospital for work or golf.

Experience has also shown that a certain class of patient on recovery of the use of a functionally disabled limb regains his normal mentality and is able to throw off all his psychic disturbance. We need a record of the particular class of case in which this treatment is successful. We need to follow up the cases where the psychic disturbances have been thus neglected or where they have been indirectly treated, and to record, not only the speed, but also the permanence of the cure. When the psychic disturbance is allowed to persist behind the scenes, a showy lightning removal of some bodily functional disability is no true cure at all; the same (or some other) disability will later develop on the slightest provocation. In this connexion I would point out how prone the enthusiastic devotees to one special mode of treatment are to self-deception. I have repeatedly had some method demonstrated to me by its advocate, who has said to me: "See what a marked improvement (say) in stammering has been effected by my treatment," whereas to a dispassionate observer the benefit is almost, if not quite, imperceptible.

In my early experience of shell shock I came to lay great stress on disturbances of personality, and I regarded the amnesia and the bodily disorder, mutism, tremor, incoördination, or spasmodic movement, so commonly observed in cases seen soon after their onset, as the expression of this change of personality, due, like it, to some functional dissociation. Accordingly, I adopted the therapeutic principal of restoring the amnesia with or without the aid of hypnosis; and with the restoration of the amnesia came a restoration of the speech and a resumed control of the bodily movement. Brown,[14] who pursued the same method, came to the conclusion that its efficacy was due not so much to the redintegration of the normal personality as to the working off (abreaction) of the repressed emotion. On the other hand, I appeared to produce as good results by discouraging the patient from giving rein to his emotions during treatment. But clearly a series of carefully controlled investigations is required, in which equal numbers of patients are exhorted to restrain and to express their emotions, and the resulting effects compared. Later I began to treat the bodily disabilities first and the mental disturbances after. We have yet to discover which order of treatment should be adopted in different cases.

Electrotherapy and Hypnosis.

Lastly, there remain for consideration and unbiased investigation the debated values of electrotherapy and hypnosis. Each, if improperly used, has its dangers. I have seen vast numbers of stammerers whose condition, I am convinced, has been produced by the alarm they experienced during the electrical treatment of their previous mutism. I have observed similar results from the application of faradism to other functional motor disorders. Yet I should err in recommending that electrotherapy should never be employed. What we need is an inquiry into the special conditions in which it is beneficial and the particular methods which free it most completely from danger.

Perhaps against no method of treatment has there been greater prejudice than against hypnosis. Early in the war I remember the commandant of one military hospital telling me that he would not in any circumstances countenance its employment because the reputation of his unit would suffer thereby. I have read pages of vituperation against hypnosis written during the war by medical men who had had no personal experience of its use. Imagine what would be our attitude towards a physician who wrote in condemnation of a particular drug which he had never tried. There is, however, an instinctive aversion from the practice of hypnosis which seems to justify almost any attack against it. I recognised it for a long time in myself. Hypnotism savours of the uncanny, mysterious, and unknown. One's first attempts at hypnotism demand even more self-mastery than one's first sight of an operation.

In these circumstances what an urgent need there is for a dispassionate investigation of its merits and defects, of its uses and abuses! It has been claimed that hypnosis makes the patient for ever dependent on the hypnotiser. We may ask, Must it do so, any more than exploration of the mind in the waking state need make him dependent on the explorer? We need to inquire into the different results in this respect arising according to the different modes of hypnotic treatment adopted. It has been urged that hypnotism gives the patient a temporary relief, like a hypnotic drug or a brandy-and-soda. That, again, must depend on the method of its use.

Here, too, we need careful inquiry into the comparative values of hypnosis as a method of mental redintegration (unearthing repressed complexes) and as a method of somatic redintegration (restoring bodily disabilities by direct suggestion). And, above all, we need an inquiry into the subsequent permanence of cure of those patients who have been treated by either of these two methods with and without hypnotism.

Is it too late to hope that systematic inquiry may yet be begun, at least along some of the lines which I have indicated in this paper? Up to now the field has been almost wholly neglected. Far from being barren, it is rich with the possibilities of valuable results.

[14] THE LANCET, August 17th, 1918, pp. 198, 199.

INCIDENCE OF *ENTAMŒBA HISTOLYTICA*

AND OTHER INTESTINAL PROTOZOA AMONG 400 HEALTHY NEW ENTRIES TO THE ROYAL NAVY.

By H. A. BAYLIS, M.A.,

ASSISTANT, DEPARTMENT OF ZOOLOGY, BRITISH MUSEUM (NATURAL HISTORY); PROTOZOOLOGIST (TEMPORARY), ROYAL NAVAL HOSPITAL, HASLAR.

THE large amount of work that has been done in connexion with amœbic dysentery during the last three years has opened up a number of questions, not the least interesting of which is to what extent carriers of *Entamœba histolytica* exist among the civil population in countries with a temperate climate. Some inquiries on this point have already been made in this country, more particularly by the energetic group of workers at the Liverpool School of Tropical Medicine, who have been engaged primarily in the protozoological investigation of the stools of soldiers invalided from the various fronts.

A summary of the results originally published in their earlier papers,[1 2 3 4] together with more recent data, was presented by Professor Warrington Yorke[5] before the Society of Tropical Medicine and Hygiene in June, 1918. An instructive table is there given, in which the results of the examination of various classes of civilians and young recruits are compared with those obtained in the course of routine examinations of convalescent soldiers, both dysenteric and non-dysenteric. Among 450 civilian patients in the Liverpool Royal Infirmary it was found that 1·5 per cent. were carriers of *E. histolytica*, while the examination of 246 children under 12 years old in the Liverpool Children's Infirmary revealed 0·8 per cent. "positive."

The incidence among recruits, 18 to 19 years of age, who had been in a training camp for various periods not exceeding three months, was considerably higher (5·2 per cent.). This may be partly accounted for by the fact that there were also in the camp some men who had returned from the Mediterranean area, and from whom the recruits might have acquired their infections. This hypothesis, however, as the author states, would not altogether account for the facts, since it was proved that many of the recruits had almost certainly been infected before going into the camp.

From these results it appears therefore that in some sections of the civil community in England there may be carriers of amœbic dysentery to the extent of from 1 to 5 per cent. of the apparently healthy population. If this is the case, questions naturally arise as to the wisdom or necessity of spending much time and trouble in discovering and attempting to cure such carriers, as has been done to a great extent among the naval and military forces during the war.

On the publication of the statistics above referred to, it was suggested to the Admiralty by Surgeon Captain P. W Bassett-Smith, C.B., R.N., that the protozoologist at Haslar

should undertake an inquiry on similar lines, making use of new entries to the Navy at Portsmouth as a sample of the material from which the Navy is recruited. Accordingly, instructions were given by the Admiralty, and arrangements having been made through Surgeon Lieutenant-Commander P. Fildes, R.N.V.R., in charge of the laboratory at Haslar, with the medical officers of the Royal Naval Barracks, Portsmouth, and one or two other establishments in the neighbourhood, for supplies of material to be sent to the laboratory, the work was begun in July.

I. *Material.*

Altogether specimens of the stools of 400 men who had just entered the service were examined.

With the exception of a few from the Royal Marine Barracks, Eastney, and a still smaller number from the Royal Marine Barracks, Forton, all these came from the Royal Naval Barracks, Portsmouth.

The new entries at the barracks were attending in daily batches at the sick bay for throat-swabbing, in accordance with the routine for the detection of carriers of the meningococcus. It was found convenient, therefore, to arrange that five of these men daily should be selected at random and specimens of their stools collected and sent to Haslar. The men came from all parts of the country, and this system of random selection was calculated to ensure that the cases examined would not be representative of any one particular district or section of the civil community, but would be a fair sample of the whole.

Owing to the pressure of work on the medical staff at the barracks, and other considerations, it was not found possible to obtain the histories of all cases sent for examination, but it was thought sufficient to make special inquiry as to the history of each case found to be a carrier of *Entamœba histolytica*. A scheme of questions was drawn up, as to whether the man had ever been abroad, his occupation, residence, &c., during civil life, and whether he had ever had symptoms of intestinal disease. These questions were put to each man as occasion arose, and the answers provided the "histories" to be given later.

II. *Technique.*

As it was desirable to examine a fairly large number of cases, and considerations of time and convenience of arrangement with the barracks had to be taken into account, it was decided to allow only one examination in each case. It was therefore necessary to define, as a standard, exactly what constituted "one examination." In practice, in the routine examination of patients in the hospital, it had been found that the exhaustive inspection of two cover-glass preparations of thin emulsions of each stool was generally sufficient for one examination (i.e., if cysts or amœbæ of *E. histolytica* were present in any given specimen, they would generally be detected by this method, unless the infection was a very slight one). In fact, records were to hand showing that two preparations had been the average number devoted to each first routine examination of new cases for many months at Haslar.

This standard was therefore adopted in dealing with the whole of the 400 new entries; it had the advantage of rendering the results more nearly comparable with those obtained for convalescent dysenterics and other patients examined in the hospital, and these will be given for the sake of comparison, being now published for the first time in full.* It also happens to be identical with the standard adopted for "one examination" by the Liverpool workers, (1, p. 412) and therefore makes the results strictly comparable with theirs, except in so far as the personal element has to be considered.

From each specimen, then, two small drops of emulsion were placed side by side on a slide, and each covered with a cover-glass. As a rule, one emulsion was made in normal saline, the other in Weigert's iodine solution, and the "loopfuls" of fæces were usually taken from different parts of the specimen, to allow for the possibly unequal distribution of the protozoa. The two preparations were then gone over *completely* under the microscope with the aid of a mechanical stage, using a ⅙ inch objective and a No. 3 (× 8) ocular. If no protozoa were found, the case was recorded as negative. If any cysts of doubtful nature were found, it was sometimes necessary to make further preparations, but this, of course, does not alter the standard of "one examination."

III. *Results.*

The results of the investigation may be most conveniently stated in the form of a table. It may be mentioned here that in no case were any active amœbæ found. In all cases the terms *Entamœba histolytica* and *Entamœba coli* refer to the encysted forms. Table I. shows the incidence of *Entamœba histolytica* and other intestinal protozoa among new entries to the Royal Navy and Marines at Portsmouth. Total number of cases examined = 400. These men came from all parts of the British Isles, and were in no way representative of this district in particular.

(*a*) Total number of cases found to be infected. (*b*) Col. (*a*) as percentage of the cases. (*c*) Pure infections. (*d*) Mixed infections.

TABLE I.—*400 New Entries.* TABLE II.—*888 Patients.*

Organism.	(*a*)	(*b*)	(*c*)	(*d*)	(*a*)	(*b*)	(*c*)	(*d*)
Protozoa of any kind ...	120	30·0	110	10	202†	22·7	179	23
Entamœba histolytica ...	10	2·5	9	1	52	5·9	35	17
Entamœba coli	94	23·5	86	8	118	13·3	104	14
Entamœba nana	3*	0·75*	1*	2*	—	—	—	—
Giardia [*Lamblia*] *intestinalis*...	22	5·5	14	8	47	5·3	41	6
Chilomastix [*Tetramitus*] *mesnili*	1	0·25	—	1	2	—	1	1
Trichomonas hominis ...	—	—	—	—	2	—	—	2

* The figures for *Entamœba nana* cannot be regarded as trustworthy, as no special effort was made to search for it, and when present in small numbers it may have been frequently overlooked.

† Including 3 cases of *Entamœba nana* (which was only recognised during the latter part of the period covered, and even then probably often overlooked) and 1 case of an amœba of the *limax* type.

Before discussing the significance of these results it will be well to compare them with those derived from the examination of cases in the Royal Naval Hospital, Haslar, between March, 1916, and July, 1918, most of whom were convalescent dysenterics, or were suffering from intestinal disorders of various kinds, and had been serving abroad, many of them in the Mediterranean area. Table II. shows the incidence of the various protozoa among 888 such cases. Account is taken only of *first examinations*, in order to make the results more comparable with those already given. When further examinations are included, the percentages of "positives," of course, increase with every additional examination.

It has not been possible to classify the cases included in Table II. into men who have and men who have not suffered from dysentery, as the laboratory records do not supply sufficient information as to their history. It should be borne in mind, however, that some of the cases included in the table were at the time of examination actually in an acute phase of amœbic dysentery, or, at all events, were passing active amœbæ. At the first examination free amœbæ were found, either alone or together with the cysts, in nine cases. Subtracting these from the 52 in column (*a*) in the table, we have only 43 *E. histolytica* carriers, as distinct from actual cases. This brings the percentage 5·9 in column (*b*) down to 4·8.

Comparing the two tables (I. and II.), therefore, we find that the incidence of the "harmless" protozoa severally—*Entamœba coli*, *Lamblia intestinalis*, and *Tetramitus mesnili*†—and that of protozoa taken as a whole is actually higher among the "new entries" (more or less representative of the civil population of the British Isles) than among the men who have been in regions where they would presumably be more likely to be exposed to infection; while the presence of *Entamœba histolytica*, though of considerably lower frequency than among the latter, is still about half as frequent. It must be remembered that all the figures probably err on the side of being too low, owing to the small number of examinations of each case, and that they give a totally inadequate idea of the actual incidence of infection. In Section V. an attempt will be made to estimate the probable amount of error in the case of *E. histolytica*, and it may be assumed that at least an equal amount of correction would be necessary in the case of the other protozoa.

IV. *Histories of the "New Entry" Cases Positive for* Entamœba histolytica.

A summary may now be given of the histories, as far as they are known, of the ten cases found to be carriers of *E. histolytica*.

CASE 5.—Age 18; farm labourer; usual place of residence, Fetlar, Shetlands (in a village with 100 inhabitants). States he has always lived at home until entering the Service, working on a small farm. Has never been abroad. Has never had symptoms of intestinal disease.

* A note on the protozoological findings in the first 394 cases examined at Haslar has been published in the Medical Research Committee's Report on Dysentery Cases received from the Eastern Mediterranean. (Special Report Series, No. 6, III., 1917, p. 24.)

† *Trichomonas* was not found at all among the new entries.

CASE 27.—Age 32 years 9 months; plumber; residence, Reading. Had resided at Baroda, India, for three years (February, 1915, to May, 1918), and had had a slight attack of dysentery there in 1917.

CASE 40.—Age 33; schoolmaster; residence, Preston. States he lived in the country in Lancashire until 12 years of age. Has never been abroad. Has had recurrent attacks of diarrhœa at intervals of nine months, lasting three or four days; last attack four months previous to examination.

CASE 44.—Age 21½; fitter and tailor; residence, West Bromwich, Birmingham. Has never been abroad. Has never had symptoms of intestinal disease.

CASE 84.—Age 18; outside porter; residence, East Grinstead, Sussex. Never abroad. Never had symptoms of intestinal disease.

CASE 161.—Age 18; bootmaker; residence, Kettering, Northants. Never abroad. Never had symptoms of intestinal disease.

CASE 211.—Age 18; bricklayer's labourer; residence, Wolverhampton. Never abroad. (This case was admitted at Haslar with "catarrh," developed pneumonia, and died before further information could be obtained. At the post-mortem examination made by Surgeon-Lieutenant S. L. Baker, R.N., nothing abnormal was found in the intestines.)

CASE 374.—Age 38; fireman in Merchant Service; residence, when in England, Rotherhithe. Had been in the service of the Orient Line since 20 years of age. Never had symptoms of intestinal disease.

CASE 389.—Age 19; fisherman; residence, Portstewart, Coleraine, Co. Derry, Ireland. Never abroad. Never had symptoms of intestinal disease.

CASE 393.—Age 27; ticket collector; residence, Queenstown, Co. Cork, Ireland. Never abroad. Never had symptoms of intestinal disease.

The following points of interest may be extracted from the preceding histories. Out of 10 carriers—

(*a*) Eight had never been out of the British Isles. One had resided abroad (in India) (Case 27). One had travelled extensively in the East (Case 374).

(*b*) Seven at least had never had symptoms of intestinal disease. (In regard to Case 211 information is lacking.) One had had dysentery (Case 27). One had had recurrent diarrhœa (Case 40).

(*c*) Five had lived exclusively in England. One had lived exclusively in Scotland. Two had lived exclusively in Ireland.

Out of the eight carriers who had never been abroad only one (so far as is known—*vide* Case 211) had ever had symptoms which might be attributable to his infection with *E. histolytica*.

Age and occupation appear to have no bearing whatever on the incidence of infection.

As far as the small number of cases justifies such a conclusion, infection appears to be pretty evenly distributed within the British Isles.

It is to be observed that two of the cases cannot strictly be considered representative of the population of these islands (Cases 27 and 374). The subtraction of these from the total gives 2, instead of 2·5, as the percentage of incidence (see column (*b*), Table I). There is reason to believe, however, that the real incidence is much greater, and certainly not less, than 2 5 per cent., as will be seen from the arguments in the following section.

V. *Estimation of the Probable Incidence of* E. histolytica *had all Cases received numerous Examinations.*

It is well known that infection cannot be detected at *every* examination, even in cases who occasionally pass very large numbers of cysts. The limitation of examinations to one for each case gives results which are only a fraction of the actual number of carriers probably existing in any given series of cases. Various attempts have been made to calculate the minimum number of examinations necessary in practice, and also to work out the margin of error where the number of examinations is too small.

Dobell,[6] after much study of the matter, has expressed the opinion [p. 43] that *more than three* negative examinations must be made on an untreated case before it can reasonably be said to be free from *E. histolytica*, but that it is probable that in three examinations not more than half to two-thirds of the infected cases will be detected. *Six* examinations are suggested as a minimum in practice.

The Liverpool workers[1 2] have also studied this question at some length, and their final conclusion is that *three* examinations will only discover 50 to 57 per cent. of all actually positive cases.

Owing to the regulations regarding "negative examinations" of convalescent dysenterics in the Service, the number of examinations in the Haslar series has always been too small from this point of view. The following figures show the increase in the percentage of positives for *E. histolytica* at each examination as far as the third. The number of cases examined more than three times was so small that it has not been thought worth considering in this connexion.

Out of 888 cases examined at least once, 52 (or 5·9 per cent.) were found positive at the first examination.

Out of 335 cases examined at least twice, and negative at the first examination, 12 (or 3·6 per cent.) were found positive at the second examination.

Out of 164 cases examined at least three times, and negative at the first and second examinations, 3 (or 1·8 per cent.) were found positive at the third examination.

It is calculated, therefore, that if the whole of the 888 cases in the series had been examined twice the percentage of positives found would have increased from 5 9 to 9·5, and if all had been examined three times a still further increase to 11·3 would have taken place.

These figures, as far as they go, are so closely similar to those given for a series of 1713 cases by the Liverpool workers [[2], Table XI.] that it is assumed that had more examinations been made of the whole Haslar series the percentage of positives would have continued to increase at the same rate for subsequent examinations as in the Liverpool series, and that conclusions based on that series may therefore be applied to the present inquiry.

In the Liverpool series referred to it was calculated that 33·4 per cent. of all cases that would have been found positive in six examinations were discovered at the first examination; and six examinations were calculated to be enough to detect the great majority of infections. It appears, therefore, that if the percentage of positives discovered at the first examination of any series be multiplied by 3 we shall have a moderate estimate of the percentage of positives actually existing in that series.

Applying this rule to the present series of 400 "new entries," where 2 per cent. were actually found positive at the first examination, we find that the real incidence would, in all probability, be not less than 6 per cent. Furthermore, since these men were not selected cases in any way, and were fairly representative, it is believed, of the general adult male population of the British Isles, we have the rather startling conclusion forced upon us that something like 6 per cent. of such a population are carriers of *E. histolytica*, and this figure might be found to be still too low, if a large series of cases were taken and the number of examinations of each were indefinitely increased.

VI. *The Pathogenicity of the Cysts.*

Granted that some such percentage of carriers as that indicated in the foregoing section exists among the population, it is desirable to find out to what extent they are a danger to themselves or to others with whom they are associated. The data on this subject are unfortunately at present quite inadequate.

It is now recognised that the cat is a suitable animal for laboratory experiments with *E. histolytica*, but it is not always easily infected, and young kittens have been found to be more susceptible than older animals.

It was thought desirable to test the cysts from the new entries from the point of view of pathogenicity, since it was not certain that the strains of the parasite found, though morphologically identical with those from dysenteric patients, possessed the same pathogenic properties. Accordingly two kittens were obtained and kept in readiness, soon after the first few "positives" were recorded. Unfortunately some time elapsed before another positive case was available, and by that time the kittens were almost half-grown, which possibly accounts for the failure of the experiments. The fæces of the two animals were examined from time to time before the infection experiments took place, and no parasites except those normal to cats were detected.

Experiment 1.—On Oct. 29th at 6.30 P.M., each kitten was given 10 c.cm. of an emulsion in normal saline of fæces from Case 374. (The history of this case was not known at the time.) The emulsion was made in the morning of the same day, strained through muslin to remove gross particles, and left standing at room temperature till the evening. It was examined before use to make sure that it contained a fair number of healthy cysts. The injection was given by Dr. Fildes with a 10 c.cm. syringe attached to a No. 8 soft rubber catheter, which was lubricated with glycerine and passed down the œsophagus. The two kittens were kept under observation and their fæces examined daily (with few omissions) until Nov. 15th (17 days from the beginning of the experiment). On one or two occasions there was some diarrhœa, with mucus in the stools, but no amœbæ were ever found and none of the signs of acute dysentery were observed.

Experiment 2.—On Nov. 15th, at 6.30 P.M., with the same technique as before, the kittens received injections (given by Dr. Fildes) of two separate emulsions, as follows: Kitten 1 received 10 c.cm. of emulsion from Case 389 containing numerous healthy cysts, the average diameter of which was 8 μ (a very small strain). Kitten 2 received 10 c.cm. of emulsion from Case 393, in which there were many healthy cysts of typical average diameter (13 μ). As in the former experiment, the fæces of both kittens were examined almost daily, until Nov. 29th

in the case of No. 1, and until Nov. 30th in the case of No 2, and though there were again occasional diarrhœic stools, with mucus, no serious signs arose and no amœbæ were found.

Kitten 1 was killed (by coal gas) on Nov. 29th and a post-mortem examination failed to reveal any lesions of the mucous membrane of the intestine, or any amœbæ in the contents or in scrapings from the surface. Kitten 2 was similarly killed and examined on Dec. 2nd. No amœbæ were found in the intestinal contents or in scrapings from the mucous membrane. The rectum showed prominent lymphatic nodules, but sections of these revealed nothing of a pathological nature.

It is worth recording that both the kittens were found to be fairly heavily infected with *Lamblia* (apparently the human species). The cysts were first found in the fæces of No. 1 on Nov. 2nd (four days after the first infection experiment) and in the fæces of No. 2 on Nov. 20th (five days after the second infection experiment). Cysts of *Lamblia* had not been observed in any of the human stools used in the experiments, but *Lamblia* is not known to be a normal parasite of the cat, and it is probable that the infection was artificially produced. The cysts were found repeatedly during the examinations of the fæces of the kittens, and numerous active forms of *Lamblia* were found post mortem in the lower part of the small intestine of each.

The negative result of the experiments as regards *E. histolytica* is probably of little significance. A positive result would have been valuable, but other workers have found that experiments in the infection of cats with cysts per os are often failures, especially when the cats are too old. Dale and Dobell[7] succeeded in infecting one kitten out of eight in this way, and the Liverpool workers[4] one out of four. The present experiment, therefore, though negative, must not be taken as an indication that strains of amœbæ from carriers in the British isles are non-pathogenic. Further evidence on this point is necessary before any statement of this kind can be made.

VII. *Summary and Conclusion.*

Among 400 healthy new entries to the Royal Navy, freshly joined from places all over the British Isles and examined once each, 10 were found to be carriers of *Entamœba histolytica*. Of these, 8 had never been out of the British Isles, and 7 at least had never had dysentery. Taking the 8 home cases only, the percentage of infections found at a single examination is 2. This, however, is a minimum figure, and it can be calculated that the real percentage of carriers among the adult male population must be nearer to 6. If this is the case, it may be doubted whether the rigorous treatment of carriers in the Services, who have not themselves suffered from dysentery, is justified or necessary. The percentage of carriers is naturally higher among men who have served in countries where the disease, in its acute form, is endemic, and especially under the conditions of war. But in all probability, given good sanitary conditions, the ordinary carrier is not a serious source of danger to others. The view that he is a source of danger to himself, in that he may at any time develop dysentery or hepatic abscess, remains in any case to be considered, and upon this point the present inquiry offers no evidence.

Experiments on kittens were tried with a view to obtaining evidence of the pathogenicity of the strains of cysts from the "new entries." The fact that the kittens failed to become infected is not, however, regarded as evidence for the non-pathogenicity of such strains.

The writer's thanks are due to Mr. C. C. Dobell, F.R.S., for his kind suggestions as to the general lines of the work, and for some hints on the method to be employed in the infection experiments on kittens; and to Dr. P. Fildes, Surgeon Lieutenant-Commander, R.N.V.R., for the actual performance of those experiments, and for his kind assistance and criticism throughout the work.

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THE ANALYSIS OF A COMPOSITE NEUROSIS.

BY F. DILLON, M.B., CH.B. EDIN.,

TEMPORARY CAPTAIN, R.A.M.C.; LATE NEUROLOGIST TO 3RD ARMY, B.E.F.

As for that wandering ship of the drunken pilot, the mutinous crew and the angry captain, called Human Nature, "fantastical" fits it no less completely than a continental baby a skull cap the stormy infant.—MEREDITH, "The Tragic Comedian."

FROM time to time in the study of the neuroses of war cases are met with which disclose the combination of a war neurosis with another of different order: composite conditions in which the development of a neurasthenia or allied disorder resulting from war strain has taken place in conjunction with a pre-existing neurosis or the rudiment of one.

War neuroses, in common with others we were familiar with before the war, we know to be entities of considerable complexity. These composite neuroses, however, attain a double complexity from the synthesis of two pathologically distinct conditions. From the consequent adjustment of the treatment which this implies it is of the utmost importance, therefore, for the condition to be recognised.

The case about to be described forms an example of such a condition. It was treated at an advanced centre in France, and consequently under difficult and unfavourable conditions. It presents, however, a number of points of considerable interest, not only in the fact of the improvement which resulted from an analysis left by force of circumstances incomplete, but in the illustration it provides of several of the present-day problems of psycho-analysis.

However much the significance of the sexual factor as taught by the Freudian school may be disputed, the value of the psycho-analytic method is becoming more and more widely recognised. In the stimulating nature of the discoveries made by its means and the widening scope for investigation it has suggested, it has inspired the spirit of a sort of renaissance for psychology and psychiatry. One of the chief errors, in my view, of psycho-analyst schools hitherto has been in the mode of presentment of their subject. The results of their very important investigations have been described along lines entirely uncorrelated with the principles of normal psychology. Mechanisms and principles of mental activity have been described with no reference to what was already known on the subject. In consequence it seems that two psychologies have developed—two parallel systems, the psychology of psycho-analysis, and the academic system of the schools.

This may have been inevitable in the beginning. Jung observes that psychology had little to offer to the psychiatrist until Freud's discoveries.[1] But since the publication of "Selected Papers on Hysteria" in 1895, psychology has made very considerable advances, and a correlation between the two is not only to a large extent possible, but urgently desirable.

The process, however, has by certain authorities unfortunately been carried further. A remarkable esoteric phraseology has been evolved which has had the effect not only of obscuring the issues of the subject, but by its semi-mystical colouring has laid it open to the accusation of oneiromancy and superstition.

There is, so far as I am aware, no reason why scientific knowledge should not be expressed in clear and simple language. New mechanisms, new facts as they are brought to light, undoubtedly require new names to label them, but in this case it has been carried beyond the limits of merely technical necessity. Freud remarks: "A clear and unequivocal manner of writing shows us that here the author is in harmony with himself, but where we find a forced and involved expression aiming at more than one target, as appropriately expressed, we can thereby recognise the participation of an unfinished and complicated thought."[2] In this regard the elaborate and obscure terminology developed by some of the psycho-analyst pioneers raises a suspicion—however wrong it may be—that the obscurity of expression may indicate a corresponding obscurity of conception.

Account of Case.

The present case is similar in many respects to others described in psycho-analytic literature except that it gains a special interest and importance from the fact of the

conflict which was disclosed being combined with the syndrome of a war neurosis.

Pte. C. N., an intelligent young man of 23, of good social position, was admitted into hospital on July 21st, 1917. He was in a mildly depressed state, complained that he was confused in mind and that his nerve had given way in the line. When asked to describe in greater detail his mental confusion he said that when coming down in the motor ambulance to hospital he felt as if he were losing himself and didn't know where he was. He had to sit up and look around to assure himself of his surroundings. His head felt larger than its normal size and he had a heavy feeling in it as if he had had a "night out." There was "a lack of power of thinking properly" as if there were a brake on his thoughts: a definite feeling of effort was required to think. The content or scope of consciousness seemed to be restricted and smaller than normal except when he was dropping off to sleep, when, he said, his thoughts "wandered all over the place."

He joined the Army in October, 1915, and came to France in March, 1916. He remained perfectly well, acting as stretcher-bearer, until April 10th, 1917. On that day he was one of a stretcher-squad carrying a patient to a dressing station; a shell burst in the middle of them, killing three. Patient was left unwounded and a short amnesia exists for the events immediately succeeding this. He found himself some time later lying against the wall of a house, very shaky, nervy, and jumpy. He walked down to the dressing station of a field ambulance, and after two or three days was sent down to the base. He remained there for a fortnight and then rejoined his unit. It was at that time behind the line, and patient stated that he felt well, and as they were out of the shelling area his "nerves" did not trouble him. Three or four weeks before admission to hospital he was sent into the line again to F——. Then he noticed his nerve beginning to give way; shelling made him nervous, he was jumpy, shaky, and easily scared, which he had never been before. About a fortnight later he moved to a dug-out with a signboard opposite—a signboard destined to play a significant part in his neurosis. His nerves gradually grew worse, he began to have terrifying dreams, and to feel confused and "silly"—as if he could not answer questions sensibly. The following morning he had an attack of sickness and vomiting, brought on, he thought, by eating sardines from a tin previously opened, and he was sent to hospital.

There was no history of any nervous or mental abnormality in his past life and, apart from the fact that his sister had been a sleep-walker for some years, his family history was negative. On examination of the patient there was no sign of any organic derangement.

The facts described of his history and condition were elicited without difficulty. From his manner, however, it was evident that there was something more to be told, and after some hesitation he admitted, with a certain humorous shamefacedness, that a particular image was constantly recurring in his consciousness. It kept continually obtruding itself, no matter what he attempted to do. He felt it was so ridiculous that he did not care to mention it in the first instance. He could describe it in no other way than by saying it was just like a "spotted pudding."

We have here an obsessive "overweighting of a particular element in consciousness" and consequent loss of the homogeneity of mind which is recognised invariably to denote the presence of a mental conflict.[3] The significance of this symptom was sufficient to show that we had to deal with a disorder more complex and severe than the common forms of war neuroses.

The first step in the treatment was to undertake an investigation of the obsession which offered itself for analysis. Treatment was begun on August 1st, 1917, and it will be interesting to record the material of association exactly as it was produced by the patient. The spotted pudding brought into his mind the image of the "trunk of a tree; one in a jig-saw puzzle in the ward—a white spot above it—a white rabbit—pink eyes—ferns with red flowers—Isle of Wight—Italy and Sicily—an Italian woman with a basket—wearing a navy-blue shawl—with a white edge."

At this point he stopped, and when asked to tell what was passing in his mind he became somewhat agitated and indignant, and said he repudiated the suggestion—an immoral one—that had been put into his mind regarding the Italian woman. A few further details were obtained at this interview, but from the patient's somewhat disturbed state it was considered advisable to go no further in the investigation that day.

The next morning he brought to me the following dream that had occurred to him during the night:—

I came out of a school (dirty old brick affair with court-yard), rushed past L., who was standing in the yard (dressed in dark blue), and was carried some distance (against my will) into some side streets of an unknown town.

I felt that she was hurt with me and was half afraid to meet her, yet had a deep longing to meet her. She apparently followed me (in a very dignified mood).

She came down a *narrow* street to where I was standing and the last I saw was a man in khaki trying to force his attention on her while she was still resisting. (I *knew* that his attempt to force his company on her would be unsuccessful.)

This, it is evident, is a dream in which the meaning is very little disguised. The manifest is little different from the latent content, and the elements of conflict are readily discernible.

Analysis brought to light the fact that some time before the war he had fallen in love with, and become privately engaged to, a girl much beneath him in social position. His people were aware of the attachment and bitterly opposed to it. He was not in a position himself to earn a livelihood but was living with his people at home who, he knew, would cut him off if he married without their consent. All his prospects were bound up with his people's goodwill towards him. Relations were consequently very strained at home: an uncomfortable restraint grew up between him and the rest of his family and every meeting with his *fiancée* had to be arranged by subterfuge.

A further factor which intensified the conflict was the strong love he had for his mother. Since his love difficulty he had had to repress his feelings for his mother—he must give it all, he said, to one or the other. And he had realised lately how much he owed his mother, how much she had sacrificed for her family. His duty towards her he conceived to be respect and love, but he felt that under the existing circumstances this was impossible. He was not sure, he said, if he was justified in continuing this attitude of suppression towards his mother; he felt that he was not doing what he ought to be doing. It implied that he would have to make a decision sooner or later unless he could lead a double life. This, in brief outline, was the substance of the conflict.

It is interesting to observe how the elements of conflict are expressed in the dream itself. L., of course, is his *fiancée*, manifested directly without symbolic concealment. The phrases, "Rushed past L.," "Was carried some distance (against my will)," "I felt that she was hurt with me and was half afraid to meet her, yet had a deep longing to meet her," very clearly indicate the conflicting impulses of his state of mind. The school he recognised to be one he used to pass every day when at home; the dream, the story or reproducttion of his mental conflict, is given, in other words, in the first place its natural or realistic setting. The unknown town he realised at once to be Arras; he could see, he said, the wreckage and ruin about him. Arras had made a great impression on him. He was in the Arras sector when he broke down and had to be sent to hospital. It formed, in fact, a symbolical indication of the mental wreck he found himself as the result of the conflict. "She came down a narrow street to where I was standing." This led him through a series of associations to a street—a narrow street—in his home town and a block of flats there, the sort of flat, he said, he would choose as a home if he could afford it—an interpretation whose significance is sufficiently apparent. The analysis of the "man in khaki" brought out further factors of the conflict. He proved to be the girl's present employer, who, patient said he had reason to believe, was forcing his attention on her; he had read between the lines of her letters.

The investigation of this single dream supplied, it is evident, an illuminating insight into the patient's state of mind, and it furnished, further, the key to the solution of the "spotted pudding" obsession, the analysis of which had been left incomplete. The Italian woman, patient admitted, was his *fiancée*, L., and when the significance of the attribute Italian was investigated he stated that the foot-shaped contour of Italy brought him back to the preparatory school in which this had been first impressed on him. He remembered that at this school he had been punished by the teacher for something he was not guilty of, and the strong feelings of resentment and injustice he had felt had made an impression, he said, which remained to the present day. The Italian attribute expressed symbolically the feelings of resentment and injustice associated with the idea of L. against his people in their treatment of her.

As the nature of the condition was rendered clear it became evident that the symptoms expressive of war strain—the shakiness, loss of nerve under fire, &c.—were of minor importance in comparison with the mental conflict seen to be dependent on causes wholly antecedent to the war condition.

The shock received from the explosion of the shell, by producing a common type of war neurosis based upon a different emotional pathology, had impaired the mental synthesis or "equilibration." It had thus created a condition of affairs predisposing to the development of the second neurosis, which till then had existed only in embryo. The former were, consequently, ignored in the further analysis of the condition as being capable of alleviation or cure only in conjunction with a removal of the deeper conflict.

The following day—the second after treatment had begun—he reported that the "spotted pudding" obsession had disappeared. It went gradually, he said. After he discovered the Italian woman she took the place for a time of the "spotted pudding," and now the Italian woman had also ceased to trouble him. Another obsession had taken their place and was constantly obtruding itself in the same way. It was the image of the sign-board that had been opposite the dug out he occupied at F ——.

This obsession was accordingly analysed and the associations as they came up were as follows:—

"The colouring of the signboard impressed him (it was an advertisement for Michelin tyres)—yellow with a bright blue edging—the French flag—colouring appeared round the word 'F——'—it changed from green to blue—became dark, almost black—the word 'F——' resolved itself into a golden line—two vertical lines appeared at the edges of it—they widened to the extent of the board—it appeared like a hansom cab seen from behind—the coachman with tall hat and cockade—it is a wedding—through the window at the back he sees a man and a woman kissing——" After some hesitation he admitted that it expressed his own wedding.

At the next interview, two days later, he reported that he felt considerably improved; his headaches were better and the obsessions had ceased to trouble him. From that time, as the analysis of the condition proceeded and one by one the various and complex factors of the conflict were brought to light, although from time to time he showed transient fluctuations, he made steady progress towards improvement.

On August 20th, 1917, that is after three weeks' treatment, he reported that the chief symptoms that remained were feelings of weakness and of effort in the attempt to do anything. The obsessive ideas had disappeared, he was free from the feeling of conflict and worry he used to have, and the paræsthesias about the head had gone.

The condition as it unfolded itself became complex to a considerable degree. It would be impossible, therefore, within the scope of a short article to describe all the elements as they revealed themselves and brought to light the various aspects of the many-sided conflict. Two further dreams, however, are of some considerable interest. The first is as follows:—

I dreamt that as I lay in bed I suddenly realised the presence of a cat (dark colour) on my right shoulder. I stroked it and it commenced purring, whereupon I disposed of it (how I don't remember). Then another cat (also of dark colour) appeared in the same position, but it was not quite as tame as the former. Whether it disappeared or not I cannot say, as a small dark-brown, smooth-haired *dog* made its presence felt on myself. It had hypnotising bluish-green *eyes* (with large pupils) protruding from its head, and upon my attempt to soothe it (with the ultimate intention of throwing it out of the window or otherwise disposing of it) *it bit into the palm of my left hand*, and the pain caused me to wake up.

The patient had at this stage gained a certain proficiency in the art of analysing his own dreams, and he voluntarily produced the following interpretation. The cat, he said, seemed to typify his present condition, and the disposal of the cat seemed to mean that he had thrown off and got the better part of his mental trouble. The other cat typified a more difficult mental trouble yet to be got rid of. The dark colour signified his mental condition. The fact that the second cat was not so tame meant that this remaining difficulty was not so easy to get rid of as the former one.

Here his analysis ended; as regards the dog he could find no interpretation for it. Further investigation, however, brought to light its meaning. It was shown beyond doubt to be the symbolic representation of his *fiancée*, and "bit into the palm of my left hand" he interpreted as "something I want to get rid of pressing on my brain—something that binds me, holds me captive that I can't get rid of it." The condensation mechanism in regard to this symbol is shown in an instructive way in the fact of its being associated or "constellated" with two complexes of fear, one of which was the memory of an actual experience of being bitten by a rat on one of the fingers of the left hand at the age of 5 or 6. The significance of this symbol in conjunction with the parenthetical phrase in the dream "with the ultimate intention of throwing it out of the window, or otherwise disposing of it," gives the first indication of the direction in which a solution of the conflict was shaping itself in his mind—an inference confirmed subsequently on the patient's own admission.

The remaining dream is not without its humorous aspect.

Someone (connected with the staff of this hospital) appeared and told me that Captain Dillon had committed suicide (as far as I can remember by means of a razor). I know that the scene where the dream took me was unfamiliar, but cannot recall details.

The "someone" on analysis proved to be my clerk, and the patient's immediate further association was that the clerk prepared all the base lists. He was wondering if he were going to be sent down to the base. Captain Dillon was the person who was at the time keeping him back. The unfamiliar scene he associated as "the roadway through the gate of the hospital—outside—freedom—Blighty." The dream, in short, expressed his desire to get to England. He had, in fact, a doubt as to whether he was being treated in order ultimately to be sent back to the line again. Captain Dillon formed the obstacle to his desire, and it is arranged that he conveniently puts himself out of the way.

The mechanism is well illustrated here of exaggeration or over-estimation of dream impulses by which difficulties or obstructing influences are removed not merely sufficiently for the purpose in view, but in an unnecessarily complete and extravagant way. This is well shown, too, in the dream of a patient who came to me in a very distressed state of mind because he dreamt that he had murdered his father. His father, it transpired, was a chronic invalid and a severe burden on the patient, who had a difficult struggle to keep his wife and children in decency. In the dream the unconscious took a thorough and effective method of disposing of the handicap, although consciously the patient had never entertained more than a passing and involuntary regret over the state of affairs.

Conclusion.

The treatment extended over a period of six weeks. Two days before being evacuated to the base the patient reported that the sense of fatigue had diminished, the feeling of restriction to consciousness had gone, and his power of concentration was returning.

The case illustrates in a striking way the great value of early treatment in disorders of this class, and shows that much may be done even under the conditions of an advanced centre in France. It forms a certain endorsement of the mechanisms of dream formation and of the principles in general of psycho-analysis. But, probably as important, it brings forward certain problems in the subject which are still awaiting settlement.

It will be noted, for instance, that all of the dreams in the case were not found to contain on analysis a sexual interpretation, as taught by Freud. My limited experience in this respect coincides with that of the schools of Jung and Adler in opposing the exclusively sexual interpretation. As regards, too, the question of a fixed symbolic meaning I am led to agree with Jung, who teaches that there are no fixed symbolic meanings to the images in dreams. "The various dream pictures have each their own peculiar value."[4]

Another feature of the subject illustrated is the fact that while in some dreams the whole manifest content is "phantastic" in form, every element being disguised in symbolic figures, in others this is only partially the case, certain of the elements being used "realistically" in their everyday significance or value. To what extent the components of a dream are to be interpreted symbolically depends on the ultimate analysis of the dream as a whole.

In his conception of the "manysidedness" of dreams Jung has laid emphasis upon another aspect of dream formation of very great importance. "In view of the comprehensive manysidedness of the dream material," he writes, "one must beware above all of one-sided formulations. The manysidedness of the meaning of a dream, not its singleness of meaning, is of the utmost value, especially at the beginning of the psycho-analytic treatment."[5] This is well shown in the first dream described above.

Finally, there is the problem raised by the nature of the conflict revealed in the analysis. We have had to deal here with a neurosis, the expression of a mental conflict dependent

inherently, not on early or infantile "fixations," but on a present and pressing difficulty urgently requiring removal. In a chapter in "Analytic Psychology" Jung discusses with Dr. Loÿ whether there are not certain moral problems in their nature incapable of solution. In the present case, analysis brought to light a conflict which was in large part unconscious, in which the opposing factors were unrecognised by or unknown to the patient. By this means the import and significance of the disrupting influences affecting his mind were made conscious and clear to him, the different elements as they appeared laid before him, as far as possible, in their true proportions. A new mental orientation was thus made possible for him, a new capacity given him to deal with the situation. Jung says: "Because (men) will not and cannot think out to its logical conclusion what it is they really desire, their erotic conflict is largely unconscious."[6]

The case, I am aware, affords opportunity for an exponent of the extremer school to maintain that if the analysis had been carried far enough the inevitable early sexual "fixation" would have been unearthed—perhaps in this instance in regard to the relation of the patient to his mother. It is not, of course, impossible, but as it can be neither verified nor disproved it has little practical bearing on the subject.

On the other hand, the disappearance of the obsessions and the improvement which resulted in the remaining symptoms are sufficient practical indication of the accurate direction of the treatment. An interesting epilogue is formed by a letter received from the patient a month after evacuation from the hospital, in which, after expressing his thanks for the treatment, he says: "I had very little faith in it until I realised that you had (1) analysed and thereby dispelled the obsessions I was troubled with; and (2) proved to me the mistaken attitude I had adopted towards certain matters."

Since the article was first written I have learned that the patient is now back at his former occupation.

References.—1. Analytic Psychology, p. 355. 2. Psycho-pathology of Every-day Life, p. 114. 3. Hart: Psychology of Insanity, p. 163. 4. Jung: Loc. cit., p. 308. 5. Jung: Loc. cit., p. 217. 6. Jung: Loc. cit., p. 372.

THE PREVENTION AND TREATMENT OF DIABETIC COMA.

BY P. J. CAMMIDGE, M.D. LOND.

OF all the complications of diabetes mellitus the commonest and most fatal is coma. In 50 to 60 per cent. of cases it is the immediate cause of death, and when once developed is usually fatal within a day or two, and sometimes within a few hours, of the onset of the characteristic symptoms.

Symptoms.

Coma may occur early or late in the course of the disease, although it is particularly prone to develop during the first year of treatment, and is more common under than over 40 years of age. The most striking symptom, exaggerated respiration without cyanosis or evidence of physical cause, often appears with dramatic suddenness. The respiratory movements change their character and gradually involve all the accessory muscles of respiration, inspiration is prolonged like the breath preceding a yawn, while expiration seems forced and more complete than normal, the so-called air-hunger of Kussmaul.[1] In the earlier stages the respiratory rate is not much accelerated, 16 to 20 a minute, but as the coma deepens it becomes more rapid and may reach 40 a minute, and there is then no evident pause between inspiration and expiration. A characteristic sweet, fruity odour of the breath, which may pervade the whole room, is noticed occasionally and will suggest to an experienced observer the cause of the coma. The face has an anxious expression and is sometimes flushed, although it is often pale and drawn, with a yellowish tint. The eyes are generally half closed, the pupils react to light until deep coma occurs and are usually dilated, less often contracted. Softening of the eyeball, due to a fall in the intraocular pressure, is an early and important sign of diabetic coma. The pulse is soft and accelerated, but rarely exceeds 120 a minute. The blood pressure is always low and falls further as the coma develops. The usually subnormal temperature of a diabetic rises with the onset of coma and may reach 100° F. or thereabout, but as death approaches it sinks again and may fall as low as 90°. The extremities are cold and in some instances there is slight œdema of the feet.

Although coma may develop suddenly, particularly in the course of some intercurrent infectious disease, it is usually preceded by several days of suggestive symptoms, which point to the imminence of its occurrence. The appetite becomes capricious, digestive disturbances and slight nausea are complained of, weight is lost more rapidly than would be expected merely from defective nutrition, and cramp in the legs and abdomen occurs, particularly at night and the early morning. The patient becomes restless and irritable, and complains of headache, which is frequently attributable to the obstinate constipation which usually exists. Marked lassitude supervenes, and this is followed by drowsiness, which gradually deepens into profound coma from which the patient cannot be roused.

Coma of the type described is met with in many cases, but in some typical air-hunger is slight or absent and cardiac weakness dominates the picture. The patient may die suddenly with few warning symptoms, consciousness being retained to the end, or there may be a complaint of nausea or weakness, the pulse is found to be soft and rapid, 140 to 160 to the minute, the heart sounds are barely audible, and loss of consciousness is rapidly followed by death. In a few cases the onset of coma is ushered in by acute excitement and convulsions.

Indications of Commencing Acidosis.

Although the clinical symptoms of diabetic coma usually develop with startling suddenness, and the premonitory signs are often so slight or indefinite as to be easily overlooked, regular examinations of the urine, blood, and alveolar air furnish indications of the probable onset of the complication, so that if they are frequently carried out it should come as no unforeseen event. Ever since Stadelmann, in 1883, discovered oxybutyric acid in the urine in severe diabetes and compared diabetic coma with the condition produced in animals by poisoning with mineral acids, it has been recognised that diabetic coma is usually associated with a high degree of acidosis which, unlike the acidosis occurring in conditions where there is no disturbance of carbohydrate metabolism, is accompanied by the presence of acetone bodies in the urine.

The appearance of these bodies is usually the first sign of commencing acidosis. As the alkaline reserves of the body are lowered, through their being used for the neutralisation of the excessive formation of acids, the tolerance for sodium bicarbonate increases so that instead of 5 g. (77 gr. or 1¼ dr.) given by the mouth, being lowed by the excretion of part in the urine, with a consequent change in the reaction to litmus from acid to alkaline as in normal persons, 75 to 100 g. (2½ to 3½ oz.) or more may be required in individuals on the borderland of coma. At the same time there is an increase in the ammonia output in the urine from the normal of 0·5 to 1·0 g. per day, up to as much as 10 or even 12 g. in cases of deep coma. As a rule an excretion of 4 g. a day rarely exists for more than a few days without coma developing. Normally the ammonia nitrogen constitutes 4 to 5 per cent. of the total nitrogen of the urine, but as coma becomes imminent 40 to 50 per cent. of the nitrogen may be excreted as ammonia.

A useful indication of serious acidosis is a diminution in the available carbonates circulating in the blood which may be determined indirectly, from a lowering of the carbon dioxide of the alveolar air, or directly from the blood itself. The carbon dioxide of the alveolar air can now be estimated at the bedside very easily and quickly by the simple and ingenious method devised by Marriott,[2] but for the analysis of the carbon dioxide content of the blood the more elaborate laboratory methods of Van Slyke[3] are required. A diminution in the titratable alkalinity of the blood indicating an acidosis of clinical significance can be readily detected by the method described by Sellards,[4] which depends upon the change in reaction to phenolphthalein from alkaline to

[1] Deut. Arch. f. klin. Med., 1874, xiv.

[2] Journ. Amer. Med. Association, 1916, lxvi., p. 1594.

[3] Proc. Soc. Expt. Biol. and Med., 1915, xii., 184; Journ. Biol. Chem., 1917, xxx., 305, &c.

[4] Principles of Acidosis, Harvard Univ. Press, 1917, p. 103.

neutral of the protein-free filtrate of the serum when the alkali reserve of the body is definitely subnormal.

Criticism of Alkali Therapy.

Clinical experience and many laboratory experiments have suggested that diabetic coma is the culminating point of an increasing acidosis, and one might therefore expect that therapeutic measures to counteract and control the acidosis would prevent the onset of coma and cure it should it have developed. The obvious treatment would be to make good the alkaline reserves of the body and ensure their being maintained at the normal level by the administration of alkalies by the mouth or, if need be, by intravenous injection. It is true that a certain degree of success has apparently attended this method of treatment, and there are even a few cases of diabetic coma on record where large doses of sodium bicarbonate have saved the patient, at any rate temporarily, but on the whole the results of alkali therapy have been disappointing, and it can hardly be claimed that the death-rate has been materially improved by it. After all, it is only symptomatic treatment which does not touch the source of the trouble, the excessive formation of organic acids. Moreover, the attempt to control an acidosis with alkalies is not always free from danger and discomfort. Large doses of alkali, such as are often necessary, are apt to cause irritation of the gastro-intestinal tract and give rise to nausea and vomiting, especially if not administered in very dilute solution, and then the large amount of fluid may overburden the stomach and throw excessive work on the kidneys. When taken over long periods alkalies interfere with digestion, tend to deplete the body of necessary salts, particularly chlorides, and have a depressing effect on the heart if sodium salts are chiefly used. Finally, as Joslin has pointed out, it is possible that the administration of alkalies over long periods may set free acid bodies existing combined, quiescent, and harmless in the tissues, and so do harm, for the constant use of alkalies appears to promote the constant excretion of acid bodies. It is doubtful, therefore, whether the attempt to treat acidosis and prevent coma in diabetes with alkalies is sound practice, more especially as Allen's experiments[5] have shown that in diabetic dogs no apparent prolongation of life results from keeping the alkaline reserve of the body normal with alkalies given intravenously or by the mouth.

Control of Fat Intake.

A more satisfactory way of attacking the problem would be to prevent the formation of unoxidised acid products by limiting the material from which they are derived, and this is quite a feasible proposition, for the work of Rosenfeld, Hirschfeld, Magnus Levy, and others have shown that fat is the chief source of the acetone bodies and that it is from the fat of the food they are mainly derived. Recent work has proved that careful control of the fat intake in the diet is one of the most certain practical methods at present at our disposal for preventing acid intoxication and subsequent coma. By this means Joslin,[6] who was a pioneer in that aspect of the treatment of diabetes, has been able to reduce his death-rate through coma from an average of 64 per cent. to 44 per cent.

There seem to be two reasons why systematic control of the fat intake in diabetes has been hitherto neglected: (1) the very prevalent idea that diabetes is merely a defect of carbohydrate metabolism; and (2) the generally held doctrine that loss of weight by diabetics must be prevented at all cost. Experiments with diabetic animals and clinical observation have alike shown that both these ideas are erroneous. Diabetes is not a mere inability to assimilate glucose; from the first it is a defect in the metabolism of carbohydrate, protein, fat, and probably mineral substances as well, so that treatment directed to the control of the glycosuria alone deals with one aspect of the disease and overlooks what may be more serious but, for a time, less evident defects in the chemistry of the body. The treatment from the commencement must be based on the hypothesis that we have to deal with a general failure of metabolism, and that while restriction of a single food principle, such as carbohydrate, may suppress the symptoms temporarily the progress of the diabetic process can only be prevented and complications, including coma, avoided by dealing with the condition as a whole.

Fat being the principal source of the unoxidised acid end-products giving rise to acidosis, control of the fat in the diet of a diabetic is obviously a matter for serious consideration from that point of view alone, but it is also important from another aspect. It would seem that the weakened metabolic functions of the diabetic are capable of dealing with only a definitely limited load, and that when this load is exceeded failure of the metabolic processes occurs. Consequently, although a reduction of the carbohydrate in the diet may stop the glycosuria, it will not prevent the disease progressing if the total intake of food is maintained by adding fat or protein. The metabolic functions will then still be over-taxed, and in spite of an apparent improvement the glycosuria will eventually return with increasing acidosis, &c. For a time the progress of the disease may again be stayed by lowering the carbohydrate intake, but so long as the total load of food is not reduced the downward progress of the disease will continue. In other words, the case will have the characters of a progressive diabetes with a steady fall in carbohydrate tolerance, a type one so frequently meets, especially in young people where an attempt is being made to keep up the weight by over-feeding with fat and protein. If, on the other hand, such patients are allowed to lose weight until the body mass is reduced to a level that can be maintained by a total load of food below what can be efficiently dealt with by their defective metabolic powers the apparently inevitable progress of the disease is checked, return of the glycosuria is prevented, and acidosis is avoided, or at least kept within narrow limits. It is true that patients treated in this way become thin, but it does not follow that they are less efficient muscularly, for, as Williams's experiments have shown,[7] and my own clinical experience confirms his results, muscular efficiency and weight are not synonymous. A thin patient feeding within his metabolic limits can do more, and is less easily tired, than one who is over-taxing his metabolic powers in an attempt to maintain a hypothetical weight for an individual of his size or who is over weight.

Causation of the Coma.

Regulation of the fat intake in diabetes undoubtedly places in our hands a most useful weapon for combating acidosis, and it appears probable that the death-rate from coma may be materially reduced thereby, especially when control is exercised from the earlier stages of the disease, but it does not necessarily follow that no other methods are available to reduce still further a mortality which is appallingly high.

It has been for so long the custom to accept acidosis and coma as cause and effect in diabetes that the possibility of the acidosis being an associated, and perhaps an incidental, phenomenon has not received the attention it deserves. The failure of alkali therapy to achieve the results expected of it has been one of the main stumbling blocks in the way of a general acceptance of the acid intoxication theory, and it has therefore been suggested by some that the ketonic acids and their salts induce coma, not in virtue of their acid properties, as that theory assumes, but in consequence of some specific toxic action they possess. But experiment has proved that these substances are not poisonous to normal animals in doses likely to be met with in practice. To meet this difficulty it has been claimed[8] that aceto-acetic acid and its salts are toxic if the animal is first rendered diabetic by extirpation of the pancreas. I am not prepared to deny that a diabetic and a normal animal may react differently to these substances, and that they may be more poisonous to the former than to the latter, but the fact that a condition which is known to alter fundamentally the metabolism of the body, and of itself leads to coma, has to be instituted before reasonable doses produce a toxic effect rather tends to weaken the force of the argument.

There can be no doubt that coma is the consequence of an auto-intoxication, but consideration of the evidence available suggests that it is a toxæmia resulting rather from the general failure of metabolism occurring in diabetes than from a specific toxin originating in a break in the chemistry of the body in one particular direction. It seems most likely that coma may be produced by several toxins of different origin acting together. In some instances, however,

[5] Amer. Jour. Med. Sci., 1917, March.
[6] Treatment of Diabetes Mellitus, Lea and Febiger, 1917, p. 342.
[7] Arch. Int. Med., September, 1917, p. 399.
[8] Poulton: THE LANCET, June 29th, 1918, p. 897.

the metabolic defect may be more complete or rapid in one direction than another, and occasionally there may be associated defects in excretion, such as we know to occur in interstitial nephritis, which will cause one type of poison to have a preponderating effect. In this way we can account for the variations in the symptoms met with in different cases and for the occasional beneficial effects of the alkaline treatment.

Possible sources of toxins, other than fat, are carbohydrate and protein, while the modifying influence of inorganic salts on metabolism must also be taken into account. It is unlikely that carbohydrates give rise to poisonous materials that tend to produce coma directly, for experience has shown that increase in the carbohydrate content of the diet when coma threatens often brings about a temporary improvement, especially when the patient has been treated previously on the historic lines of a "carbohydrate-free" diet, consisting chiefly of protein and fat. Indirectly an excess of carbohydrate in the diet, no doubt, has an influence in causing this complication, first through its effect in accentuating the metabolic deficiencies which underlie the diabetic condition, and secondly through the dehydration of the tissues consequent on the presence of an excess of sugar in the circulation. Water is needed to maintain the volume of the blood required for the mechanical efficiency of the circulatory apparatus, to carry nourishment to the cells, to remove the waste products of metabolism in solution, and to maintain the osmotic conditions essential for cell life. When it is abstracted from the body, and the loss is not made good owing to conditions of the gastro-intestinal tract which prevent retention and absorption, acidosis, sudden large inflammatory exudates, and other reasons, serious and rapid loss of weight occurs, the respirations and pulse increase in frequency, the systolic blood pressure falls, the tension of the eyeball is markedly diminished, the tongue becomes dry and parched, there is oliguria with constipation, the patient becomes restless and irritable, then apathetic, and, finally, comatose. The similarity of these symptoms to many of those met with during the onset of diabetic coma suggests that some of the latter, at least, may be a consequence of the dehydration of the tissues produced by a high concentration of sugar in the blood. It also helps to explain the frequency with which coma is precipitated by gastro-intestinal disturbances, particularly when there is vomiting or diarrhœa, and by conditions where large inflammatory exudates take place.

Disturbances of Protein Metabolism.

In 1913 Pribram and Loewy[9] suggested that abnormal products of protein cleavage might be responsible for part of the symptomatology of diabetic coma. Other authors have since claimed that death in some cases may be entirely due to the effect of toxins resulting from the imperfect metabolism of proteins, and quoted cases of fatal coma where no evidence of acidosis existed.[10] The occurrence of such cases, the absence of typical air-hunger in many instances, and the failure of alkali therapy to control the coma in most cases favour the argument that the condition does not always, or entirely, depend upon the acid products of defective fat metabolism and lend support to the view that other toxins are involved.

It has been shown experimentally that some of the products of protein disintegration are toxic, producing among other symptoms lowering of the blood pressure, depression, and narcosis, but no attempt appears to have been made to isolate such substances in diabetes. Some experiments I commenced four or five years ago with that end in view had to be abandoned temporarily, but so far as they went, and taken in conjunction with the results of the routine analysis of the urine in a large number of cases, they showed that protein metabolism in diabetes tends to become less and less complete as the disease advances, and that this is associated with a progressive failure in the functions of the liver similar to what is met with in acute yellow atrophy, some of the toxæmias of pregnancy, &c. One of the most striking features of the urine in all severe cases of diabetes is the constant presence of amino-acids, which increase in amount as the disease advances, so that the amino-acid nitrogen often constitutes 50 per cent. or more of the total "ammonia nitrogen" as estimated by the Malfutti formalin process. In one instance, for example, I found 6·3 g. of amino-acid nitrogen out of a total of 7·8 g. of "total ammonia nitrogen" in a 24 hours' specimen of urine passed six days before death from coma took place. In three cases where an analysis of the collected 24 hours' urine was made shortly after the premonitory symptoms of coma had appeared the amino-acid nitrogen was found to have dropped suddenly and in one had entirely disappeared, although 4·3 g. had been present the previous week. The nature of the amino-acids was investigated in 11 cases, three of which eventually died of coma. Tyrosin, histidin, phenyl-alanin, and glycocoll were found in all, while tryptophan, alanin, leucin, and arginin were only met with in the more advanced. In two cases, both of which died shortly after of coma, an amine resembling in some respects a toxic base described by Dale and Laidlaw[11] was isolated. Very often a marked increase in the uric acid output, which may reach 8 or 9 g. a day, is seen at, or about, the same time as the rise in the amino-acid nitrogen occurs and without any change in the diet being made. As a rule, the curves of excretion of uric acid and creatinin tend to run in opposite directions in diabetes and the rise in the uric acid preceding the onset of the symptoms of coma is no exception, a corresponding fall in the creatinin output usually being seen. Simultaneously the excretion of urobilin in the urine increases. These observations point to the onset of coma being associated with a failure in the functional activity of the liver, and it seems likely that the resulting imperfections in protein metabolism may be a contributory factor at least in bringing about the condition.

Effect of Withdrawal of Bases from the Tissues.

In a previous paper[12] I considered the effect of the withdrawal of bases from the tissues resulting from acidosis, and particularly of calcium and magnesium. I there pointed out that a balance between the two appears to be necessary for the smooth and efficient working of the nervous system and that an excessive loss of magnesium is associated with nervous instability. A striking increase in the magnesium and calcium loss in the urine is a constant feature of all severe cases of diabetes, and it is not unlikely that this loss renders the nervous system more susceptible to the action of toxins formed in the liver and elsewhere. The experiments of Osborne, Mendel, and Ferry lend support to this view, for they found that rats fed on a diet poor in inorganic salts, but otherwise satisfactory, eventually developed coma, and that they could be resuscitated by the administration of a mixture containing calcium and potassium phosphate, sodium chloride, and citrates of sodium, iron, calcium, and magnesium.[13]

Preventive Treatment.

If, as the foregoing considerations suggest, diabetic coma is not due to one cause, but is a complication arising from the cumulative effects of several, which result from the general metabolic failure of the diabetic organism, it is clear that treatment directed to one cause is not likely to control the symptoms, at any rate, more than temporarily, and that the only "cure" is to prevent all possible causes by so arranging the diet that (1) the patient's tolerance for carbohydrate, protein, and fat is not exceeded; (2) the total load of food is within his metabolic capacity; (3) the diet is correctly balanced; and (4) a sufficient allowance of inorganic salts is provided. Obviously the earlier in the course of the disease such treatment is commenced the better are the results likely to be and the less difficult will it prove to arrange a diet fulfilling the necessary conditions, but even with advanced cases a surprising improvement can be effected by careful dieting along these lines.

When a diabetic patient is first seen no change should be made in the character of his food. If possible he should be kept for a few days on an ordinary mixed diet of known composition and the opportunity taken to investigate his metabolism by analyses of the urine, blood, &c. The effect of excluding fat from the diet should then be tried. After a day or two on a fat-free diet the protein may be reduced by half. Subsequently the carbohydrate allowance may also be halved, then the remainder of the protein excluded, and the carbohydrate further reduced until a diet of green vegetables of low carbohydrate value only is being taken. If

[9] Zeit. f. klin. Med., 1913, lxxvii., 384.
[10] See Pauly and Boulud, Lyon Médical, March, 1917, p. 118.
[11] Journ. Physiol., 1910, xli., 318.
[12] American Medicine, June, 1916, p. 370.
[13] Carnegie Institute of Washington, 1911, 156, ii., 80.

sugar is still being excreted in the urine or the blood sugar is high and serious acidosis or evidence of abnormal tissue waste persist, two or three days' "starvation" may be prescribed, but longer continuous fasts are best avoided. Abstinence from food usually has a remarkable effect, improving carbohydrate tolerance, correcting errors in protein metabolism, and reducing acidosis, so that patients apparently in a grave condition may often be rescued and put on a metabolic basis that permits of a satisfactory diet being subsequently constructed.

The building up of the diet must be gradual and be carried out in the reverse order to that outlined above—that is to say, green vegetables alone, with a gradually increasing carbohydrate content, should be allowed first, then a very limited amount of fat-free protein, such as boiled white fish or chicken, is added, more carbohydrate is next given, and later the protein is increased until the patient is in nitrogenous equilibrium. When this point is reached fat may be allowed, at first in small quantities and later in larger amounts, but the effect on protein metabolism and the utilisation of carbohydrate must be carefully watched by regular examinations of the urine and blood. It is necessary that part of the carbohydrate should continue to be taken in the form of green vegetables, the exact proportion varying according to the patient's tolerance for starchy foods. It is also an advantage if at least one serving of raw vegetable (e.g., as salad) is eaten each day. These precautions not only help to overcome the constipation from which most diabetics suffer, but also ensure a sufficient supply of the inorganic bases that are essential for proper metabolism and render the medicinal use of alkalies unnecessary.

No attempt should be made to work the diet up to a theoretical caloric content based upon the size of the individual. If this can be done without risk so much the better, but the future progress of the case should not be sacrificed for a merely temporary benefit. The diet must be arranged to suit the patient's present metabolic capacity, not his appetite; in other words, he must be taught "to eat in order to live, not live to eat." The cardinal and very common mistake of an unbalanced diet should be carefully avoided. The effect of an excess of carbohydrate soon shows itself in the urine and is easy to recognise, but the equally deleterious results of too much protein or fat are not at once so evident. The best guide to the protein limit is the nitrogen balance, and the protein allowance should be so arranged that its nitrogen content does not exceed the daily total nitrogen output in the urine by more than 1 or 2 g. So long as this ratio exists further trouble from disturbances of protein metabolism need not be feared. Fat, unbalanced by other foods, is an insidious poison for the diabetic, and every endeavour should therefore be made to keep the fat allowance at a level corresponding to the patient's capacity for dealing efficiently with other foods. For practical purposes it may be taken that the allowance of fat, at least in the earlier stages of treatment, should not exceed the allowance of carbohydrate, or at most not be more than half as much again. A higher proportion is likely to lead to subsequent difficulties, and these are certain to occur if the proportion of fat to carbohydrate is more than 4 to 1. Determination of the fat content of the blood is undoubtedly the best guide for ascertaining the optimum allowance of fat in the diet, but regular estimations of the percentage of sugar in the blood also give useful indications, for a steady increase, especially if not associated with glycosuria, suggests that too much fat is being taken.

I have recently had under my care a patient, sent to me by Sir John Tweedy owing to an eye trouble associated with diabetes, who illustrated this point very well. When I first saw him his blood sugar stood at 0·20 per cent. and he was passing 15 g. of sugar a day in his urine. After a week of treatment the glycosuria had disappeared and his blood sugar had dropped to 0·08 per cent. A week later on a diet containing 50 g. of carbohydrate and 70 g. of protein, but practically no fat, the blood sugar had risen to 0·11 per cent. He was then given fat in gradually increasing amounts up to 60 g., when it was found that the blood sugar had risen to 0·18 per cent., although there was no sugar in the urine. On dropping the fat to 10 g. but not otherwise altering the diet, the blood sugar came down to 0·11 per cent. again. A return to the previous allowance of fat was followed by a rise in the blood sugar to 0·18 per cent., but still without glycosuria.

Treatment of Cases with Coma.

So long as the exact cause of diabetic coma remains obscure preventive treatment based upon a system of dieting calculated to stay the progress of the disease as a whole is the most certain means for eliminating this, and other, complications. It sometimes happens, however, that a patient is not seen until coma has developed or its onset is imminent. Under these circumstances he should be put to bed and be kept warm with suitable clothing, hot bottles, &c. All disturbing influences should be avoided and absolute rest and quiet be insisted on. The bowels should be thoroughly cleared by one or two large enemata. If there is a history of constipation a small pill containing bile-salts, calomel, and pil. rhei co., or colocynth and hyoscyamus, may be given and repeated if necessary, but excessive purgation with the risk of subsequent diarrhœa must be avoided. Gastric lavage, if practicable, may help to eliminate toxins. Whatever diet has been taken previously it should be stopped and replaced by 2 oz. of lemon juice, and either 7 to 8 oz. of potato or 2½ to 3 oz. of oatmeal, taken in the form of thin purée or gruel in small quantities at 3 or 4 hourly intervals over the 24 hours. If possible the starch should be dextrinised by steaming the potato for 3 to 4 hours and gently boiling the oatmeal for 5 to 6 hours. After 24 to 48 hours even this small amount of carbohydrate may be omitted for a day or two. From the first the patient should be encouraged to drink as much liquid as possible, preferably in the form of hot water, weak tea or coffee, thin broth, &c., a minimum total of 5 to 6 pints, distributed evenly over the 24 hours, being aimed at. Should so much fluid be refused, or if there is a tendency to vomiting, the balance should be administered as normal saline per rectum, or, if need be, intravenously. Intravenous injection should not be too long delayed, as there is much more hope of its being beneficial during the premonitory stage than when coma has actually developed.

It has been the custom to give large doses of alkali in coma and threatened coma, but lately Joslin has claimed that better results can be obtained if alkalies are avoided altogether and simple salt solution, or even tap water, is used for injections. According to him, if alkalies have been given previously they should be omitted at the rate of 10 g. a day. There are some cases which are undoubtedly benefited by alkali therapy, however, particularly those where there is a uræmic element in the condition, and I therefore think that if speedy improvement does not follow the measures outlined above alkaline injections should be tried. Small uncontrolled doses are useless, the only method likely to be of much avail is to employ massive doses and regulate their administration by repeated examinations of the blood by Sellards's method or by estimations of the carbon dioxide content of the alveolar air. The injections should be continued until it is clear that any acidosis, whether due to the diabetic condition or to uræmia, has been neutralised by a return to normal of the titratable alkalinity of the blood or of the carbon dioxide content of the alveolar air. The copious diuresis that follows large intravenous injections will tend to eliminate other toxins, and bleeding from the opened vein to the extent of 10 or 20 ounces will also help in that direction.

Bicarbonate of soda is the alkali usually employed for intravenous injection, although some have advocated the use of the normal carbonate, on the ground that it has a greater neutralising power; but this advantage is more theoretical than real, for while it is true that weight for weight the carbonate can neutralise more than one and a half times as much acid as the bicarbonate, the latter can be used with safety in so much stronger solution that the difference is more than counterbalanced. Observation has shown that an average adult possesses not much more than 200 g. of sodium bicarbonate, or its equivalent, in a form available for the function of respiration, and that with a deficit of 150 g. or more air-hunger and coma develop. We may therefore assume that in most cases of coma a dose of bicarbonate of soda approaching 150 to 200 g. (5 to 7 oz.) will most likely be required. It would obviously be dangerous to introduce this amount into the circulation at one dose, and the maximum that should be attempted is 50 to 60 g., in the form of a litre of a 5 to 6 per cent. solution, or 1½ oz. of sodium bicarbonate in 30 oz. of water. The solution should be sterilised if possible, but precautions should be taken to prevent the formation of the caustic normal carbonate,

which readily occurs on boiling. If the bicarbonate solution is filled into strong narrow-necked bottles, with tightly-fitting stoppers tied in place so as to reduce the air-space to a minimum, this danger is very largely avoided, and to make sure a stream of carbon dioxide gas may be bubbled through the solution after it has cooled. In an emergency unsterilised tap-water may be used without serious risk. The solution should be injected by the gravity method very slowly, half to one hour being allowed for a litre, and it should be kept at or about the temperature of the body. It is usually necessary to repeat the injection in about six hours, and if need be it may be repeated again after 12 and 18 hours.

Cardiac stimulants are advisable at an early stage in all cases of coma or threatened coma. Digitalis, subcutaneously or by the mouth, is probably the best, but strychnine, caffeine, alcohol, ether, camphor, ammonia, and pituitary extract may also be useful. There is a natural disposition to administer oxygen to relieve the distressing symptoms of air-hunger, but it is a useless procedure, excepting for the mental effect on those who are watching, for the difficulty in respiration has been proved not to be due to lack of oxygen.

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

A NOTE ON THE FORMATION OF OTHER AGGLUTININS IN CASES OF MALTA FEVER.

BY L. T. BURRA, M.D. OXON.,
LATE TEMPORARY CAPTAIN, R.A.M.C.

THIS note was written with a view to its publication in June, 1916, when the work was cut short by my transfer from Malta to Egypt, but owing to circumstances which arose at that time permission to publish it was withheld. I am indebted to Colonel A. C. O'Sullivan, A.M.S., for his permission to publish it, which was granted at a later date, and of which I now avail myself.

In the course of routine examinations of patients' sera in the laboratory of the Military Hospital, Imtarfa, Malta, I noticed that in cases of Malta fever agglutinins for the *Vibrio choleræ* appeared, although, according to their histories, the patients had not been inoculated against cholera and had no symptoms of cholera. I have not been able to collect sufficient cases to state that in cases of Malta fever there is always the power to agglutinate a cholera emulsion, but the occurrence of this phenomenon in six cases is perhaps sufficient justification for drawing attention to it in this note.

The routine examinations of sera for agglutinins were made on slides by the rapid macroscopic method, using dilutions of serum from 1 in 10 upwards and emulsions in normal saline of dead and washed bacteria. In three cases the sera were put up in a series of dilutions in Wassermann tubes in the usual way, and were examined after 24 hours at the laboratory temperature.

The results of my observations were that in all six cases both *M. melitensis* and *V. choleræ* were agglutinated. In one case the serum when first examined agglutinated the former only; two weeks later there was feeble cholera agglutination as well, while six weeks after the first examination this serum agglutinated *M. melitensis* up to 1 in 1600 and *V. choleræ* up to 1 in 200. In those cases in which I had enough serum I added to a 1 in 5 dilution of the serum an equal quantity of the emulsions of *M. melitensis* and *V. choleræ* in separate tubes, examining the serum for agglutinins after 24 hours at laboratory temperature. In every case saturation with *M. melitensis* emulsion removed the power of agglutinating cholera; and in the four cases in which the serum was saturated with cholera emulsion it retained its power of agglutinating *M. melitensis*.

I am indebted to Professor Zammit for the sera of three goats which were known to be infected with *M melitensis*, which I examined on the same lines as the human sera. All of these sera agglutinated *V. choleræ* as well as *M. melitensis*, and after saturation with *M. melitensis* emulsion this power of agglutinating *V. choleræ* was removed.

In no case was the serum heated, and in none of the patients was the *M. melitensis* grown from the blood, so that the evidence of *M. melitensis* infection may be considered insufficient. The point, however, may be of interest to those who have the material for further investigation, and for this reason I draw attention to it. In conclusion, I wish to express my thanks to Professor Zammit and to Surgeon Lynch, R.N., who kindly provided me with some of my material; and to Captain W. B. Alcock and Captain N. Campbell, R.A.M.C., for their advice and suggestions as to the tests which I have made.

Aylesbury.

A CASE OF ASPIRIN POISONING.

BY F. W. LEWIS, M.R.C.S., L.R.C.P.,
ACTING MAJOR, R.A.M.C. (T.).

IN view of the promiscuous way in which aspirin, often self prescribed, is taken by the general public, the following case is of considerable interest to the profession.

Patient, sergeant, U.S.A., aged 24, was admitted to the Thetford Military Hospital on Oct. 25th, 1918, with the history of having been taken ill two days previously with influenza. He was a powerfully built man and gave no history of previous gastric or intestinal trouble. He stated that he had been taking aspirin capsules of his own in addition to 18 5-gr. tablets given to him by the medical orderly. Instead of keeping to the prescribed dose, he had taken them all, together with a number of capsules in the course of six hours. He did this in order to get fit quickly, as he was under instructions for France.

On admission patient was markedly anæmic, temperature 101·4° F., pulse 120. During the day he vomited undigested milk, with no trace of blood. On Oct. 26th the anæmia was more profound. Pulse 150—weak and irregular. An enema was administered with little result. The vomiting continued at intervals. On the following morning, at 5 A.M., a large quantity of blood was passed by the bowel and he rapidly became unconscious. No thought of an exploratory laparotomy could be entertained. He died a few hours later.

Post-mortem.—There was no peritonitis, and no free fluid in the abdominal cavity. The last 5 feet of the ileum was acutely congested, and the cæcum and colon were loaded with blood clots. The line of demarcation between healthy and congested bowel was very definite. On opening the small intestine it was found to be uniformly inflamed. The mucous coat had apparently disappeared, leaving the submucous coat and blood-vessels exposed and eroded. Bleeding from this large area had evidently been the cause of death. The other organs were in a healthy condition.

Remarks.—Aceto-salicylic acid is known to pass unchanged through the stomach and upper portion of the small intestine, and is then converted into free salicylic acid. It is probable that this man took nearly 200 gr. of the drug into an empty alimentary canal, and that the salicylic acid formed was responsible for the removal of the whole lining membrane of the bowel in the area described. The mucous membrane of the cæcum and colon appeared to be unaffected. An inquest was held and a verdict of "Death by misadventure through an overdose of aspirin" was returned. It would be interesting to know if this possible action of large quantities of salicylic acid on the bowel is recognised, or if this case may have been due to some impurity in the aspirin.

A CASE OF STRANGULATED FEMORAL HERNIA.

BY STEPHEN M. LAWRENCE, M.D., B.S. LOND.,
M.R.C.S., L.R.C.P.,
ASSISTANT SURGEON, GRAVESEND GENERAL HOSPITAL; SURGEON, YACHT CLUB, V.A.D. HOSPITAL.

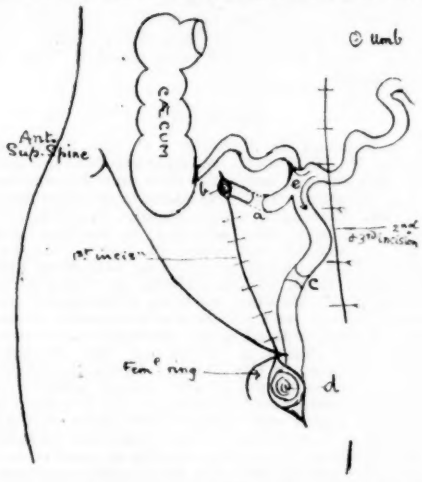
THE following case of strangulated femoral hernia seems worth recording, partly because it is unusual for such a condition to come under treatment so late and partly because several mistakes were made in the treatment, and by these mistakes it is hoped that something may be learnt.

The patient, aged 47, is the mother of nine children. She sent for her doctor on Nov. 27th, 1917, who diagnosed a strangulated femoral hernia which had existed for four days. She had been in great pain all this time, had vomited continually, and had passed no flatus, but she had not kept in bed.

First operation (Nov. 27th, 1917).—On opening the sac it was found full of offensive pus and a knuckle of gangrenous bowel, about 2 inches long, which was giving way at the

neck of the sac. The same incision was extended upwards and outwards, the deep epigastric vessels ligatured, Poupart's ligament divided, and the peritoneum opened, thus exposing well the whole damaged bowel without pulling on or in any way disturbing the parts. The strangulation was about 5 feet above the cæcum. About 5 inches of the gut were removed. An attempt was then made to get the cut ends delivered out of the wound for an anastomosis. But the mesentery was so œdematous, congested, and friable, that any further handling caused tearing and bleeding, and, what was worse, stripping of bowel from mesentery. After wasting much time in this attempt and arresting hæmorrhage, another three or four inches had to be resected where it had stripped from the mesentery, and, finally (what should have been done in the first instance) a Paul's tube was tied into the proximal gut. This was anchored to the lower end of the incision (i.e., the femoral ring) and the distal gut anchored to the very top of the incision. The patient stood the operation better than I expected. The Paul's tube held for three days. The superficial part of the wound suppurated and prevented further operation for seven weeks. In the meantime the patient lost much flesh although she took food well, and in spite of opium and bismuth, which were exhibited to delay peristalsis.

Second operation (Jan. 16th, 1918).—A vertical incision was made just to the right of the middle line. Towels were clamped to the edge of the wound by Van Houzel and Backhaus forceps. On opening the peritoneum it was difficult to identify the parts because of adhesions, which considerably delayed the operation. The distal portion of the bowel, which had shrunk to very small dimensions, was then divided at (*a*), about 3 inches from where it was anchored to the skin (*b*), and both ends closed. A lateral anastomosis was then made to the proximal gut at (*e*), about



8 inches from where the latter was anchored to the femoral ring (*d*). The distal gut was so small and the proximal so large that, fearing symptoms of obstruction, the division of the latter at (*c*) was left for the subsequent operation. I thought that by plugging the orifice at (*d*) the fæces could be induced to go entirely along their new channel, and that possibly a third operation might not be necessary. This was undoubtedly a mistake.

The patient suffered no shock from the operation, but had severe ether bronchitis with a marked rise of temperature. After 14 days, by the aid of enemata, about half the fæces appeared in the stools. After that the amount in the stools steadily declined. Plugging the orifice was useless. The plug was forcibly ejected after much pain. Saline aperients, which the pharmacologists tell us act chiefly on the lower bowel, were tried, but only increased the amount on the dressings. The patient's skin got very bad. She became emaciated, listless, and depressed.

Third operation (Feb. 18th, 1918).—The abdomen was opened through the scar of the last operation, much care being taken to shut off the skin, which was very swollen and eczematous from being in constant contact with fæces. This operation proved the most difficult of the three on account of the massive adhesions. It was impossible to identify the piece of bowel for severing except by pushing a long instrument into it through the opening at (*d*) and feeling for the end inside the abdomen. It was divided about 5 inches from its opening on the surface. The end of the bowel was then closed—silk for the mucous membrane and catgut Lembert sutures for the peritoneal surface. I used catgut because I feared a possible stitch sinus. But the catgut must have slipped and fæces in abundance appeared in the wound on the third day. The mesentery of the detached piece of bowel (*c-d*) was next ligatured and divided. This piece of gut was then forcibly dragged out of the wound, leaving a large hole at the site of the femoral ring, admirable for draining. The central wound was then closed and a drainage tube placed in the old femoral ring. The patient was so well after the operation that on the third day I risked ordering an enema. This was most disastrous. Fæces again appeared in the wound and I thought I had lost my patient. However, this was the only time we saw them. From that time on she never looked back again. Liquid paraffin was the aperient used on all occasions.

The little portion of bowel (*a-b*) has never been detached, and when she left the hospital it formed a small sinus 3 inches long, occasionally discharging a little mucus. Subsequently this has quite dried up. No special measures were taken to repair her femoral ring and yet there is no hernia now. Considerable praise is due to the sister in charge of the case for not infecting the central incision after the second operation. The patient coöperated well, too, telling the nurse directly she was soiled.

She is now at her work again and feels no abdominal discomfort, and has even discontinued her liquid paraffin, which was such a stand-by earlier. She consulted me about two months ago because she thought she was pregnant.

Reviews and Notices of Books.

The Operative Treatment of Chronic Intestinal Stasis. By Sir W. ARBUTHNOT LANE, Bart., C.B., Consulting Surgeon to Guy's Hospital and to the Hospital for Sick Children, Great Ormond-street. Fourth edition, revised and enlarged. London: Henry Frowde and Hodder and Stoughton. 1918. Pp. 328. 20*s.* net.

EVERYONE who has devoted any attention to the matter must recognise that to Sir Arbuthnot Lane we owe in great part the increased attention now given to the dangers attendant on the too prolonged retention of fæcal matter in the bowel. He it was who first drew attention to the risks of absorption from the intestine of the products of the activity of colon bacilli and of other micro-organisms; and it was he who first laid stress on the importance of kinks in the bowel produced by adhesions as the causes of intestinal stasis. And so clearly has he put forth his facts and his inferences, so carefully has he marshalled the data on which he founded his theories, that now those who accept his conclusions are continually increasing in number, and yearly more and more surgeons base their practice on his teachings. We do not say that Sir Arbuthnot Lane may not have pushed his theories too far; he may have thought that their application was wider than it really is, but even allowing for the over-enthusiasm of the discoverer there can be no doubt that he has brought to our notice facts that were almost unknown or ignored before, that he has pointed out a potent cause of much chronic ill-health, and that he has indicated the direction which treatment must take if these evils are to be overcome.

This book is not the unaided work of Sir Arbuthnot Lane, for he has many coadjutors. Dr. Alfred Jordan has contributed a most important chapter on the investigation of chronic intestinal stasis by means of the X rays; he shows the immense value of the additional information that may be obtained by the use of this method, so that the surgeon shall be in a position to act with the best effect when the abdomen is opened. Dr. Nathan Mutch has supplied a short but valuable chapter on the bacterio-chemistry of the small intestine and a much longer chapter on chronic streptococcal infection. Professor Arthur Keith has written on the great bowel from the anatomist's point of view, and Professor J. G. Adami has furnished a chapter on intestinal stasis and intoxication. The relation of intestinal toxæmia to loss of accommodative power has been explained by Mr. Ernest Clarke, and Dr. Leonard Williams insists on its importance from the medical standpoint. Major White Robertson has described the blood picture of this condition, and Mr. Harold Chapple has written on the gynæcological aspect of the stasis. The connexion of pyorrhœa with stasis in the bowel has been pointed out by Mr. Harry Forsyth. It will thus be seen that Sir Arbuthnot Lane and his collaborators have traversed the whole field of intestinal stasis; they have collected together a vast corpus of information all bearing on the subject, and the reader cannot fail

to acknowledge that there is a large amount of truth in the claim that intestinal stasis is a potent factor in disease, and that the prevention and removal of the stasis is of vital importance. The veriest sceptic, if indeed there be any such, cannot rise from the perusal of this volume without recognising that the matter deserves the closest study. To all medical men we commend this book, for it gives a full and faithful presentation of this important subject.

A System of Clinical Medicine. By THOMAS DIXON SAVILL, M.D. Lond. Fifth edition, thoroughly revised. London: Edward Arnold. 1918. Pp. 948. 28*s.* net.

THE issue of a fifth edition of Savill's System of Medicine is surely an evidence of its increasing popularity. The fourth edition was issued in 1914, and reprinted in 1916. The present edition has been thoroughly revised, notably the chapter on diseases of the nervous system by Dr. Harry Campbell, and some of the sections, such as those dealing with diabetes mellitus and syphilis, have been entirely rewritten. There are many additions, amongst which may be mentioned spirochætosis ictero-hæmorrhagica, purulent bronchitis, and trench fever. So much for a short account of the more important changes in the new edition which may be of interest to those who are already acquainted with the work. To the less fortunate we may give a short description of Dr. Savill's method of dealing with the study of disease, or rather with the study of disease as manifested by any one particular patient, for this text-book is essentially clinical in its outlook. The author does not describe each disease separately, as is usually done in text-books, but the order of sequence is, as he says, that which "should be adopted in the examination of the patient," the principle throughout being to trace "from effect (symptoms) to cause (the morbid cause in operation)." To quote the author again: "Each chapter is divided into three parts. Part A treats of the *symptoms* which may indicate disease of the organ or region under discussion, the fallacies incidental to their detection, and gives a brief differential account of the various causes which may give rise to those symptoms. Part B treats of the physical signs of disease in that organ and the various methods used to elicit them. Part C, which constitutes the major portion of each chapter, is prefaced with a *clinical classification* of the various maladies affecting that region and a summary of the routine procedure to be adopted; this is followed by a series of sections dealing with the several *diseases* arranged according to their clinical relationships. For example, in Chapter III., on the heart, Part A describes and differentiates the various causes of breathlessness, dropsy, palpitation, præcordial pain, and the other symptoms which may be indicative of heart disease; Part B describes percussion, auscultation, and other methods of examining the heart; and Part C deals seriatim with the various cardiac disorders, classified and arranged on a clinical basis." To the busy practitioner the utility of such a work is obvious; in a difficult case he has but to turn to the chapter dealing with the affected region, and he finds at once a simple method of differential diagnosis. But the work is especially helpful to the student newly arrived at that stage in his curriculum when he is faced with the problem of a particular patient and is obliged to carry out his examination and make his diagnosis on its result. This text-book will help him on from stage to stage, and if in the end the diagnosis is still in doubt he will have learned how to observe accurately, how to reason clearly and correctly, and by balancing the evidence will at least be able to understand the possible diagnoses which his teacher will discuss in due course.

The Australian Army Medical Corps in Egypt in 1914–15. By Sir J. W. BARRETT, K.B.E., M.D., F.R.C.S., Temp. Lieutenant-Colonel, R.A.M.C., and Lieutenant P. E. DEANE, A.A.M.C. Illustrated. London: H. K. Lewis and Co., Ltd. 1918. Pp. 259. 12*s.* 6*d.* net.

THIS book is very much of the nature of an expanded report on the working of No. 1 Australian General Hospital at Cairo and the Australian Branch of the British Red Cross Society. Sir James Barrett combined the duties of consulting oculist and aurist and registrar of the hospital, and executive officer of the Australian Branch of the Red Cross Society; Lieutenant Deane was quartermaster to the hospital. The presence of this Australian Hospital in Egypt was especially fortunate on account of the sudden influx of wounded from the Dardanelles, which necessitated the expansion of the hospital from one of 520 beds to a group of hospitals providing accommodation for 10,500 patients. The story of the expansion is interestingly told, although perhaps the experience is not so unique as the authors imagine; very much the same difficult course of events occurred at Alexandria where the problem was tackled by the R.A.M.C. The book brings up all the various problems which have beset our armies elsewhere—the recruitment of the unfit, the drink problem, the venereal diseases problem. We are in debt to the authors for their frank account of events; their extensive experience of the methods tried to prevent venereal disease lends weight to their criticism of the new constitution of the Australian Red Cross Society, which does not allow of the spending of money for the maintenance of social clubs for soldiers:—"Why not supply for the benefit of the men places of entertainment, with music, refreshments, and the like, similar to, and better than, those which the prostitutes supplied, but minus the prostitute?" The whole-hearted coöperation of the Australian medical forces with our own and the French is incidentally revealed; Australia in the early days in Egypt provided motor transport for the whole of the wounded and gave away 75 per cent. of their Red Cross stores to hospitals for British or French troops. Over 100 pages of the book are given up to a detailed account of the work and criticism of the functions of the Australian Branch of the Red Cross Society in Egypt. The numerous photographs illustrating the book are exceptionally good; the three maps included are useful. The book is apparently intended for the Australian lay public; although it is not a contribution to the study of Egyptian medicine it will be read with much interest by every medical man who has served in Egypt.

JOURNALS.

Revista Española de Medicina y Cirugía. Provenza 273. Barcelona. Pp. 50. 2 ptas.—We have received the November issue of this review, being the fifth monthly number since its first publication in 1918 at Barcelona under the editorship of Dr. Francisco Tous Biaggi. It seems to us a practical and up-to-date addition to medical literature, such as is wanted not only in Spain but in other countries. This number contains an article on Technique in Microscope Work by Dr. Pujiula, in which he explains his methods of staining sections of nervous tissue by nitrate of silver and Kopsch's bichromic formol and the use of bichromated gum arabic in mounting. Dr. Esquerdo contributes a paper on the Treatment of Placental Remains in the Uterus. From the editorial pen there is a lucid summary of our present knowledge of the etiology, symptoms, and treatment of the so-called Spanish influenza, of which our Iberian colleagues had an early and abundant experience; their practical acquaintance with this epidemic is further shown in another series of short articles dealing with the disease from various points of view, by various well-known scientists, such as Dr. Farreras, Dr. Freixas, and Dr. Moragas, chief of the bacteriological laboratory of the Santa Cruz Hospital. The opinion of the latter observer is worth quoting, being to the effect that in the present epidemic there was something more than Pfeiffer's bacillus, the pneumococci, the diplo-streptococci and accessory bacteria which he isolated from his cases, as the initial cause of the infection; that it seemed as if the influenzal infection, benign in itself, as seen in the earlier cases of the epidemic, prepared the soil for the colonisation of the accessory bacteria which, by transmission from one patient to another, acquired an unusual virulence and gave rise to complications of extreme gravity. These views are of interest to compare with those expressed in our leading articles on the same subject in last week's issue of THE LANCET and in the present number. It would seem that in many countries work is proceeding on similar lines and that the results obtained point to similar conclusions. Another section of the publication is devoted to abstracts from other journals, both Spanish and foreign, the latter part being very copious, and embracing all the chief medical periodicals of the world, over 20 pages arranged under various headings being given up for this purpose. Another portion is dedicated to reviews of books and a list of recent publications. One interesting feature of the *Revista Española*, which should not be allowed to pass without attention being drawn to it, is that each original article is accompanied by a résumé in French, a delicate and thoughtful concession for the benefit of those of its readers who may not be conversant with Spanish. We heartily congratulate the editorial staff on the excellence of their new medical periodical and wish it every success.

FRENCH SUPPLEMENT TO THE LANCET

Under the Editorial Direction of

Professor CHARLES ACHARD, PROFESSOR OF PATHOLOGY AND THERAPEUTICS IN THE UNIVERSITY OF PARIS.

AND

Dr. CHARLES FLANDIN, D.S.O., MÉDECIN-MAJOR DE 2ME CLASSE; CHEF DE CLINIQUE À LA FACULTÉ DE PARIS.

GUNSHOT CONCUSSION OF THE SPINAL CORD.[1]

BY HENRI CLAUDE,

PROFESSOR IN THE PARIS FACULTY OF MEDICINE; PHYSICIAN TO THE PARIS HOSPITALS;

AND

JEAN LHERMITTE,

FORMERLY DIRECTOR OF THE CLINIC IN THE PARIS FACULTY OF MEDICINE.

CONCUSSION of the spinal cord had already been an object of study before the present war era, but authors were only able to devote themselves to a description of the anatomical and clinical manifestations following on direct blows to the vertebral column or on falls from a height. Experimentally it was also possible to observe the lesions produced by successive blows on the vertebræ. We may recall the studies which had already established the existence from the clinical and anatomical point of view of concussion of the nervous centres, notably of the cord, because we wish to limit this account to the description of functional disorders and alterations in the cord which occur in those who have been subjected to gunshot injury, but in whom the cord has not been directly damaged by the missile. We are speaking here of traumatisms due to the bursting of shells near the patient, or of wounds produced by projectiles which have not struck the cord itself.

I.

Concussion of the cord may be divided into two categories: (*a*) Indirect concussion, resulting from the bursting close to the patient of large shells, and in which the symptoms are caused by sudden variation of pressure. (*b*) Direct concussion, produced by the impact on the vertebral column or at a certain distance from it, of various projectiles (bullets, shell splinters, &c.), but in which the cord and its membranes have not been damaged by the missile. Such is the distinction which we have endeavoured to make in our previous work on this question. In both cases the spinal lesions are associated with the agitation of the nervous centres which have not been directly injured by the missile.

(*a*) *Indirect concussion.*—Indirect concussion includes those cases in which spinal paralysis occurs as a result of the explosion of projectiles of large calibre, and in which it is impossible to find any external wound as the explanation. From the beginning of the war these facts arrested the attention of medical officers; they have been attributed to the action from a distance on the central nervous system of the "wind from the bullet," but it is necessary to subject these observations to a critical and careful study in order to discriminate between disorders of organic origin and those of a psycho-neuropathic nature.

In France the cases of Sencert, of Ravaut,[2] of Guillain,[3] of Heitz,[4] of Babinski,[5] of P. Marie and Chatelain[6] have put beyond a doubt the existence of motor and sensory disturbances due to organic lesions of the cord in patients showing no evidence of any wound, but who were within the range of an exploding shell. A. Léri[7] has collected most of these facts in a critical study.

Functional disorder may supervene immediately after the explosion. The patient is unable to use his limbs, he has the impression that they have been carried away, whilst at the same time he often complains of severe pain in the back. Sometimes disorders at first little noticed become accentuated some hours later. On the other hand, in some cases paralyses, which before had been general, are seen to lessen and to become limited to certain limbs (Lhermitte[8]). A. Léri[9] has insisted lately on the presence of "delayed" concussion, in which several days and sometimes even weeks after the explosion the first important gross symptoms of organic lesion have made their appearance.

The spinal syndrome following concussion due to explosion generally assumes the aspect of a quadriplegia or a paraplegia caused by transverse myelitis. The paralysis is accompanied by changes in the tendon reflexes, by disturbances of sensation, weakness of the sphincters, and trophic phenomena (bed-sores), such as are found in organic spinal lesions. But it should be borne in mind that there may be partial paralysis, anæsthesia of abnormal distribution, and retained reflexes which make the diagnosis doubtful, at least at first, because the hypothesis of simple functional disease is not easy to eliminate. The organic signs then only develop slowly. Such are certain muscular atrophies indicating an alteration in the grey matter of the cord, and giving, on electrical examination, the reaction of degeneration. These amyotrophies, moreover, tend to improve.

The evolution of these paraplegias or partial paralyses occurring after concussion varies according to the extent and gravity of the lesions. Relaxation of symptoms or their transformation into others is fairly common. For example, paralysis, flaccid at first, tends to become spasmodic. Nevertheless, the prognosis often continues quite favourable. A fatal termination, however, may occur either during the early hours or days as the result of shock, or later from pulmonary complications or various infections.

It is difficult to follow completely the history of indirect spinal concussion caused by explosion, because the morbid anatomy, and, above all, the histology of the lesion has not yet been investigated. Lumbar puncture, it is true, has shown in some cases the presence of hæmorrhage into the cerebro-spinal fluid or the remains of hæmorrhage (albuminose, xanthochromia), which has induced certain authors to deduce that spinal lesions are probably hæmorrhagic in type. There is no doubt that hæmorrhagic foci are present in many cases, but at the same time we cannot exclude the view of Roussy and Lhermitte,[10] who hold that in a certain number of cases the nervous agitation caused by the deflagration has produced a direct traumatism of the vertebral column, and that the spinal concussion will therefore be of the same nature as the second category of spinal lesions, to which we have given the name of direct concussion.

The following has been urged in support of the hypothesis. The concussed man is often thrown to the ground, blown up, bruised, or buried, so that the rôle of agitation is not easy to distinguish from that of direct injury. Moreover, even when a single explosion can be shown to be the cause it occurs in the most typical cases behind the patient, who gathers the impression of having received a blow on his back or loins (Léri). There would thus be produced a sort of blow on the vertebral column, and we know as a fact that in these patients ecchymoses do occur in the limbs and certain other parts of the body exposed to the deflagration, which, acting like a blow, causes hæmoptysis, hæmaturia, and the like. It is possible that the same may hold good in concussion, or that the blow caused by the explosion is superadded to the phenomena which accompany atmospheric compression or decompression—factors often brought in to elucidate the pathogeny of concussion from explosion. Roussy and Lhermitte,[11] from a study which they have made of these symptoms, have formulated a theory which brings the symptoms of indirect concussion into close association with those of direct concussion. The impact—violent and limited by the edges of the cone of compressed gas to the spine or paravertebral region—would be comparable to the impact of a projectile. In each case, the authors say, the impact is transmitted to the nervous or spinal elements by the cerebro-spinal fluid, the sole difference being that in direct concussion the immediate traumatic agent penetrates and bruises, whereas in concussion caused by pure explosion there is commotion and agitation only.

It appears, then, that the study of direct concussion ought especially to give us interesting information, seeing that it appears to resume in a more general way the story of spinal concussion.

II.

(*b*) *Direct concussion.*—In our first study of direct spinal concussion (October, 1915) we demonstrated that the passage of war projectiles through the vertebral canal or its imme-

diate neighbourhood (fracture of the spinous processes, for instance), even when the dura mater is not injured, leads, by the violence of the impact, to a series of phenomena suggesting a lesion of the spinal cord. Further, direct concussion of the cord may result from the passage of a projectile into the spinal muscles or from the impact of neighbouring bony surfaces (ribs, spinous processes, scapula) on each other. This is direct concussion as a result of impact at a distance from the spine. The clinical phenomena are the same whether they result from indirect concussion (at a distance from the spine) or from direct (by traversing the spine).

Spinal lesions always attain their maximum intensity at the level where the violence is applied, and, of course, the disturbances observed depend on localisation of these lesions at different levels of the spinal cord.

We shall now study these disorders according to the part injured.

Cervical region.—M. Pierre Marie and Madame A. Benisty[12] have described the *transient quadriplegia* which follows injury to the cervical region; they have also pointed out the frequency of spinal hemiplegia of the concussional type which usually changes to brachial monoplegia. We have seen many cases of *permanent quadriplegia* produced by concussion in the upper cervical region. On a stage of flaccid paralysis of the four limbs there follows a more and more marked tendency to spasm and the paralysis becomes complicated by sensory disturbances, both subjective as well as objective, of spinal or radicular origin. In three cases a Claude Bernard syndrome of cervical type was present, and in one case the Claude Bernard-Horner unilateral syndrome made its appearance.

We have also seen a *primary brachial monoplegia* occurring both as a flaccid and secondarily spasmodic type; this monoplegia is usually associated with subjective and objective sensory disturbance, of radicular distribution, sometimes very obstinate.

Brachial diplegia is one of the most curious of the clinical types of cervical concussion. It occurs early as a sequel to certain injuries of the nape of the neck (transverse retro-vertebral bullet-tracks). The upper limbs are from the first completely paralysed, even while the lower limbs remain unaffected, and it is not without astonishment that some days after the injury the wounded man is to be seen standing and walking about, whilst his upper limbs, still completely paralysed, hang inert at his sides. Among the most characteristic symptoms of this clinical type we may notice shooting pains of radicular type and disturbances of sensation, especially concerning deep sensibility and tactile sense, with greatly increased interval at which compass pricks can be separately discerned, and even after the patient has recovered adequate movement of the hands the astereognosis persists. Finally we must add, to complete a very special clinical picture, frequent want of coördination of the movements of the lower limbs noticeable in the erect attitude and becoming manifest in the upper limb when movement reappears (asynergy, dysmetry), all manifestations of cerebellar nature.

This concussional brachial diplegia appears to us always to terminate favourably; movement returns little by little in the paralysed limbs, but their functional use is disturbed for a long time by asynergy or dysmetry of cerebellar type as much as by the ataxia associated with alterations of deep sensation. These last phenomena persist long into the remote phase, when the recovery of motor power is nearly complete. In two cases which we studied these cerebellar disturbances existed without paralysis or any important disturbance of sensation. Such a patient presents the staggering, tipsy gait of cerebellar lesion, whilst his movements are sudden and spasmodic, and examination confirms the presence of spasticity. This cerebellar spasmodic form of spinal concussion of the cervical region appears to us to be of favourable prognosis, for the incoördination, though well marked, passes off rapidly.

Besides these well characterised types we must include a series of *abortive forms* which vary according to the predominance of one or another symptom.

Dorsal region.—Concussion of the dorsal region gives rise to a symptomatology of which the gravity is variable from a paresis of the lower limbs lasting but a short time to a complete paralysis such as occurs after complete section of the cord, along with all intermediate types. Generally the symptoms come on with striking rapidity; motor and sensory functions apparently much involved are re-established, at least to some extent, after some weeks. Flaccid paralysis from the beginning becomes transformed in these as in the cervical forms without much delay into spasmodic paraplegia without gross sensory changes. The bladder and rectum are generally involved.

Lumbar region.—We have seen only very few cases of direct concussion of the lumbar region. Their symptomatology depends upon the height of the lesion and the addition of radicular lesions to the spinal. There is no need to insist on a common clinical picture, which is that of compression or division of the cord, capable of easy analysis.

III.

Morbid anatomy.—Cerebral and spinal concussion are regarded by most authors as based upon an anatomical substratum, of which hæmorrhage, associated or not with softening, is the usual lesion. We have been at pains since 1915, by histological examination of numerous cases, to combat this opinion, founded more on imagination than on exact anatomical examination. Hæmorrhagic foci are seen, but less frequently even than meningeal hæmorrhages, and they are not the essential and characteristic lesion of concussion. Direct concussional agitation of the nervous system leads to changes of two kinds, *diffuse* and *local*, both of the necrotic type.

Local changes.—These we have described under the term *insular necrosis*. They consist in more or less extensive foci, generally situated exactly at the level of the point of application of the injury, whether this be actually vertebral or in the vicinity of the vertebral column. In these foci the nervous elements—axis cylinders, myelin sheaths, and nerve cells—are in process of destruction or already completely transformed, whilst the neuroglial elements are in process of proliferation and new blood-vessels are being formed. The whole appears to be a process of pure necrosis without either thrombosis or hæmorrhage. Later on proliferation of the fibrillary neuroglia proceeds and disposes of the last remains of the granular bodies. In some very severe cases the interstitial elements themselves die and the focus is absolutely necrotic. The tissues of the focus are absorbed and a cavity is formed, surrounded by a neuroglial network. This observation is not devoid of interest; the appearance of the cavities in syringomyelia exhibits the most marked analogy with the loss of substance occurring in concussion.

Diffuse changes.—The diffuse changes which we have described under the term of acute primary degeneration of the spinal tracts are apt to elude observation, and can only be studied properly by the silver method and in longitudinal sections. The axis cylinders are then easy to see broken up in larger or smaller fragments, pea-shaped or moniliform. The nerve fibres have for the most part lost their parallelism, they are retracted, curled on themselves, and cross one another. Around the broken fibres are grouped the granular bodies of neuroglial origin, containing in their protoplasm the debris of axis cylinders and amœboid cells with protoplasmic processes dissociating the myelin fibres which surround them.

The structure of the grey matter is not easy to make out. The ganglion cells are loaded with lipochromes, and, above all, the protoplasm appears full of chromophile granules fused in large irregular lumps. This change appears to us characteristic of spinal concussion.

We may add that the central canal is often dilated between constrictions, and there is often desquamation or proliferation of its epithelium; curiously enough, the fibres of the roots take part in the process of acute primary degeneration noted higher up in the fibres of the cord.

We consider, then, that the anatomical lesions, of which we have here given a general picture, and which we have described elsewhere at length, are of a type so distinct that they merit a place apart in the record of the morbid anatomy of spinal lesions. The results of these inquiries are of great interest because they show that spinal concussion is not, as is generally supposed, dependent upon so simple a change as hæmatomyelia, but can only be regarded as a complication of changes occurring in the spinal cord and originally quite distinct.

We conclude further that concussion of the spinal cord, and especially direct concussion resulting from impact on the vertebral column or in its neighbourhood, should, from its etiology, its clinical course, and its morbid anatomy, be assigned a place apart in war neurology. Its history is still incomplete, but we thought it would be of interest to surgeons and physicians to have pointed out to them at this stage the principal features, for the condition deserves to be better known and not to be confused with the other common

traumatic changes in the cord on the one hand, or with functional nervous disorders on the other hand, in view of the very different prognosis and treatment needed by these diverse spinal syndromes.

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CONTRIBUTION TO THE STUDY OF THE MANIFESTATIONS OF EMOTIONAL SHOCK ON THE BATTLEFIELD.

By CL. VINCENT,

PHYSICIAN TO THE PARIS HOSPITALS; FORMERLY MEDICAL OFFICER TO THE 46TH AND 98TH R.I. AND TO THE 44TH B.C.P.

Many observations have been published dealing with mental disorders or nervous troubles following on the emotions experienced on the battlefield. In nearly all these cases the connexion between the mental and nervous troubles observed and the emotional shock which has produced them has been established on the evidence of the patient. But experience has shown us that in most cases the man has given no account of the first manifestations of his emotion. We are also aware how rapidly in the light of reflection—either spontaneous or produced by systematic questioning—the ideas which the man has about what has occurred to him become changed. If we add that in many cases the man declares that he lost consciousness it will be readily understood how difficult it is to establish the origin of mental and nervous troubles following on emotion, especially emotional shock.

The observations which recount the phenomena presented by soldiers from the moment at which the emotion occurred until their return to the normal state have, in my opinion, an entirely different value. These observations show, in the first place, that many of the disorders attributed to concussion are really manifestations of emotion; and, on the other hand, they establish the relationship between phenomena observed in certain soldiers behind the lines and at army depôts, and the quasi-instantaneous manifestations of emotional shock to which men on the battlefield have been subjected. Consequently they help, to some extent, in unravelling the nervous and mental troubles seen during the days which follow the emotion, and which are difficult of interpretation when their origin is unknown. The same observations also explain, in a measure, the differing values placed by neurologists on phenomena of the same origin, to be explained by the fact that they have seen their patient on the battlefield only and have not followed the development of the first phenomena shown; or else their observations have been made behind the lines or at depôts where they have only seen secondary and late phenomena and not the initial stage. These neurologists are talking of two consecutive and differing aspects of phenomena having the same origin.

Account of Case.

In the account which follows it has been possible to watch the man from the moment of infliction of the emotional shock to the instant at which the phenomena following the the emotion disappeared. The physical and mental disturbance lasted about a fortnight. All phases have been noted.[1]

A——, 11th Comp., 98th R.I., aged 23 years. On active service for two years. Not alcoholic. Had not been overworked. The regiment had just had a long rest. Had never suffered from concussion.

On August 20th, 1917, at 4.35 A.M., while his company was advancing to take A—— Wood, a shell of medium calibre fell on the edge of the trench whence they were starting. It slightly wounded some of them and affected another without touching him, without even throwing him to the ground, but in such a way that he was unable to follow his comrades to the assault. I was a few dozen metres away, and being warned at once ran to him, less than 5 minutes elapsing from the fall of the projectile to the moment at which I reached the man. He was sitting at the bottom of the trench, some yards from where the shell had fallen. He was trembling all over. It was impossible to get a word from him except, "Oh, my ears!" I tried to help him, but he paid no attention. I tried to make him stand up, but he remained inert. But it was "the hour H——." The men were attacking. Some had already fallen and I could not remain with A——. I said to him, "Go to the aid-post of the battalion as quickly as you can."

When I returned to the aid-post at about 10.45 A.M. my man was there. The orderly said to me, "He came in 5 hours ago." But from the trench where he had been affected to my regimental aid-post in the ravine of C—— was at least 1200 metres. Besides, he had to pass the battalion aid-post. It had not, therefore, taken him long to come.

Examination on August 20th at 11 o'clock—that is to say, 6½ hours after the shock. I put a certain number of questions to him; he answered slowly after reflection, but precisely. He gave the following information: "It was 4.30 A.M when the shell fell. I believe it was a '105.' It fell half a metre from me on the edge of the trench. Two of my comrades were wounded. One was wounded in the face. They are gone; I do not know what has become of them. I lost consciousness, but not for long. I do not know exactly for how long. When I came to myself I was trembling. Some men were passing who accompanied me to the aid-post of the battalion. I did not know where I was. I followed the stretcher-bearers in order to get here—i.e., the regimental aid-post.

Condition at the moment of observation.—Appearance dull and tearful. Pulse 110, respiration 36, although he had been lying down for some time. There was a fine tremor of the hands, but sufficiently coarse to be seen at a distance. His body did not tremble. He complained of a deep pain in his ears. He was conscious of whistling and buzzing. Auditory acuity diminished; he could hear the speaking voice at half a metre. Tendon, cutaneous, and pupil reflexes normal. Sensation normal. No contraction of the visual field.

I escorted him to the regimental aid-post, where he lay on a hanging stretcher covered by a blanket. The rest of the day of August 20th, the night of the 20th–21st, the day of the 21st, he did not stir either to eat or drink (refusing what was offered to him) or to urinate.

August 21st: Still trembling; still dull. He only answers slowly, as if with great effort, the questions put to him. Pulse 120, respiration 42. Blood-pressure: Systolic 135, diastolic 90. Same state of auricular apparatus. As he had not passed water since the morning of the 20th the hypogastric region was percussed out. A suprapubic dullness was present. He was asked to pass water. Micturition took some time. He succeeded in passing some grammes of urine, which examination showed to be normal. Lumbar puncture; cerebro-spinal fluid normal. (The lumbar puncture was carried out after retention of urine was discovered.)

August 24th: Has completely emptied his bladder this morning—about 1000 g. of urine. Trembling much less. Pulse 110; respiration 42. Ears in the same condition. Appearance less dull. It was easier to make him answer, although it still took a long time to get anything out of him.

In order to estimate his intellectual activity, we asked whether he had written home. He said that he had not, because, in the first place, he was trembling too much, and also it was not long since he had written. Usually he wrote every three days, and he had written before going into the line. When we said to him: "But that is five days ago, you should have written," he answered: "I did not think that we had been so long in the line."

He had lost count of time. He thought that it was July, whereas we were in the month of August. We gave him the paper to read. He read with difficulty, without fluency, and very differently from the way in which he read afterwards. After reading a few lines we asked him what he had read, but he was unable to say. We made him count up to 20, which he did slowly and with difficulty. We made him count from 100 to 120, which he did still more slowly. Sometimes two or three seconds elapsed between two consecutive figures. We gave him some sums to do, addition, subtraction, and multiplication, which later he did correctly, or nearly so. These he now took a long time to do and all were incorrect, even addition and subtraction. In these the results of the first two columns of addition and subtraction were correct, but those of the other columns were wrong. The results were wrong when he attempted addition and subtraction of more complicated figures. Also they were wrong because each time he had forgotten to carry. He was unable to fix his attention.

August 26th: Reading more freely than on the 24th. Counts without stopping between the numbers. Knows which month it is. Cannot remember the meaning and the words of a sentence which he has been made to copy. We again made him do the same sums he had done before. He did them very slowly. All were wrong.

August 30th: Respiration 25. Still trembled slightly, especially in the right hand. Was, however, able to write home on August 28th. The condition of the ears was improved, even though the whistling and buzzing persisted, especially in the right ear. He is fully aware that it is the month of August and that the attack was carried out on August 20th. He counts up to 20 in 7 seconds. It takes him 15 minutes to do the sums. They are still wrong, but the mistakes are fewer.

Sept. 4th: Respiration 26. Blood-pressure: Systolic 105, diastolic 70. The trembling has disappeared even in the right hand. The ear condition is still better. He suffers no longer; he is still a little annoyed at times by the buzzing, and auditory acuity is not normal. He has recovered his appearance. He no longer has the dull air which he had. He writes home every day and occupies himself in one way or another. When he was told to come in to be examined he was looking for wood to make a door to the aid-post. He did the sums in 5 minutes 25 seconds. The addition was right. There was one mistake in the subtraction and one in the multiplication. Returned to duty.

Oct. 16th, 1917: Has been on duty since the day he joined his company. Intellectual activity normal. Did the sums as described above in 6½ minutes. The addition was correct; there was one mistake

[1] In France various regimental medical officers (Voivenel: Progrès Médical, 1918; Oberthür et Duroselle: Revue Neurologique, 1916; Dide: Emotions, Alcan éditeur. 1918) have published observations made actually on the field of battle.

in subtraction and two in multiplication. The ear condition was not yet quite normal. He complained of buzzing in the ears, especially in the evening. He could not hear the watch ticking at more than 20 cm. from the right ear. Pulse 72. Respiration 24. The trembling had disappeared.

Discussion of Causation.

Before going further, the following question at once arises. To what cause are we to attribute the troubles which developed in A—— immediately after the explosion of the projectile which fell on the edge of the trench where he was awaiting the assault?

There can be no doubt that A—— was the victim of a labyrinthine concussion. It is to this that we must attribute the disturbances of hearing, the deep and diffuse auricular pain. But are we to regard the other phenomena as evidence of cerebral concussion or of emotion?

In my opinion this man is suffering from emotion and not from cerebral concussion. He did not lose consciousness or, at least, entire consciousness for a moment after the shock due to the explosion, and was far removed from the state of consciousness of a man struck down by apoplexy or by cerebral concussion.[2] I saw him a few minutes after the explosion of the shell. He was sitting, not lying, in the trench, trembling, and his expression was at the same time dull and lacrymose. He was groaning: "Oh, my ear!" On the other hand, questioned six hours after the shock, he showed that he remembered the circumstances of the occurrence. He said to me: "It was a '105,' which fell on the edge of the trench and slightly wounded two of my comrades." And what is more, he had understood the order which I gave him: "Go to the aid-post at C——," and half an hour afterwards he was there. It was 1200 metres from the trench to this aid-post, and the ground was incredibly cut up by the shells. A man suffering from concussion, who has lost consciousness, who is "knocked out," who is in transient or prolonged coma, does not behave like this.

Here, on the other hand, are some details of the observation of a man suffering from slight concussion whom I had the opportunity of seeing about 20 minutes after the shock. He was struck on August 19th in a trench at W——, about 200 yards from my aid-post. He arrived escorted by two comrades. His face was black with smoke. In giving an account of himself he said to me: "I came out of the dug-out and sat down on a windlass. Then, without knowing why or wherefore, I found myself on the ground. There I had to remain for a while. When I began to come to myself I was surrounded by smoke. I thought it was gas."[3]

Now, although this man had lost consciousness for a very short time, he was totally unable to give an account of what had happened to him. Loss of consciousness in the man suffering from concussion was totally different from the loss of consciousness which occurred in the case we are discussing immediately after the explosion of the shell. Therefore it is not admissible to say that A—— is suffering from concussion, whilst at the same time he exhibits phenomena which, taken as a whole, are characteristic of emotional shock—viz., trembling, tachycardia, and tachypnœa.

Nevertheless, two objections can be made to this point of view: (1) our man showed evidence of labyrinthine concussion; (2) he himself described the state in which he was immediately after the shock as loss of consciousness.

Let us now discuss these two objections.

(1) The fact that a man suffers from labyrinthine concussion by no means implies that he is suffering from cerebral concussion. Cerebral concussion is one thing, labyrinthine concussion another. One or other may exist alone. Cases of labyrinthine concussion without cerebral concussion occur frequently. Here is one which I saw from the very moment at which it was produced. A sentry and my assistant medical officer F—— were looking through a loop-hole at an advanced post, their heads close together. The sentry saw a boche at a loop-hole opposite about 30 metres away. He brought his rifle to his shoulder, pointed it in the direction of the enemy and fired. F—— turned away quickly, putting his hand to his left ear. At the report he felt a severe pain in his left ear, after which he heard nothing more in this ear. A moment afterwards he perceived a very sharp whistling. All that day and the next the whistling remained, and the deafness persisted. It was nearly a week before the trouble disappeared. There was in this case auricular concussion without cerebral concussion. I may add, also, without emotion.

(2) As to the statement of the patient that he had lost consciousness, it is not enough to justify the doctor in concluding that the man lost consciousness in the same sense as a patient suffering from cerebral concussion. I saw the man at the time he declared that he had lost consciousness, I enquired in what his loss of consciousness consisted, and I can only repeat that this man did not lose consciousness in the same sense as a man suffering from cerebral concussion. Without doubt he had passed through a violent mental disturbance; later I shall endeavour to analyse this mental disturbance, but there was no loss of consciousness. A—— is above all suffering from emotion, he is not suffering from cerebral concussion. The disturbances exhibited by him must be attributed to emotion, and not to concussion.

Sequence of Phenomena following the Emotional Shock.

I do not insist on the manifestations which determined the emotional shock in this man. I only wish to draw attention to the manner in which they unfolded themselves.

In the case of A—— in the space of a moment a violent emotion has disturbed his physical and mental equilibrium; nearly instantaneously he was overcome by an intense trembling; his heart beats and his respiration became extremely rapid. His mental state was changed; his face took on a lacrymose and mournful expression; it was impossible to obtain from him an answer or gesture to show that he understood what was said to him. The reaction to emotional shock was therefore immediate.

Six hours after the shock some of the phenomena still persisted—tachycardia and tachypnœa. Others had become less and been modified. The trembling had diminished but not disappeared. His appearance was still stupid, but one could get into communication with him. He answered questions slowly as if it was an effort to do so, but he answered correctly, and he gave details spontaneously. Thus after six hours, and although he was under cover, the disturbance produced in my patient's organism by the emotional shock had not yet calmed down. Certain of the physical phenomena by which emotion shows itself persisted unchanged; others were present but in less degree. The mental state appeared to approach the normal.

But this improvement of mental state was but a truce. Indeed, on the third and fourth days after the shock the state of A—— was as follows: tachycardia and tachypnœa persisted; trembling had become less and was localised to the right hand. But the mental state was more disturbed than it was six hours after the shock. A condition of stupor and pronounced mental confusion existed, which amounted to refusal of food and retention of urine. Thus, in the case of A—— the primary period of psychic inhibition had been followed by a period in which a certain psychic activity was apparent; then this period of relative improvement gave place to a period of mental confusion with stupor.

At the end of about a week all the phenomena had begun to get less, and 14 days after the onset A—— had recovered.

In A——'s case, then, emotional shock produced an immediate perturbation of the organism, the effects of which were felt for two weeks in the form of tachycardia, trembling, mental troubles in different keys and aspects, hence lasting long after the cause which had produced the shock was removed. So in certain cases the disorders following emotion on the battlefield which have been observed behind the lines or at the depôts are only the primary or secondary phenomena by which emotional shock manifests itself, and which last after the cause which has disturbed the organism no longer exists.

[2] Some cases of cerebral concussion without loss of consciousness have been published (Guillain), but they are the exception. As a rule the concussed man loses consciousness under the shock which has struck him down.

[3] This man also showed the presence of auricular concussion. Blood was running from his left ear, and with this ear he could only hear sounds with difficulty. Voltaic vertigo (right unilateral inclination) was affected. When he arrived his pulse was 110 and his respiration 26. He was not trembling. An hour and a half later the pulse was 68 and respirations 20. This man spoke to me quietly, but at times he could not find certain words, so said one word instead of another. This slight aphasia decided me to do a lumbar puncture. This proved easy, and the cerebro-spinal fluid was found to contain a little blood. There appeared to be no head wound. Shortly after the examination my attention was drawn to the patient's helmet. The left half of the helmet was indented over a circular area about 2 cm. across. A projectile had struck it here. When the helmet was replaced on the man's head the depression was found to correspond with a small region which, on parting the hair, showed bruising and was painful on pressure. This area was adjacent to the point which surgeons regard as corresponding to the inferior extremity of the fissure of Rolando. In short, the cranium via the helmet had transmitted to Broca's area a shock which at once explained alike the slight aphasia and the meningeal hæmorrhage. This man was evacuated and recovered without sequel of his cerebral concussion. He had a left otitis media, and had to undergo a mastoid operation.

THE LANCET.

LONDON: SATURDAY, JANUARY 11, 1919.

The Neuroses of the War.

THE war, now happily, and finally we trust, come to a victorious end, will not be characterised in the histories of the future by any such limiting territorial epithets as have been assigned to all previous wars. Unique in its designation as the Great War, or even simply *The* War, it has also been unique, militarily speaking, in its air and sea, under-sea, land and even under-land aspects. From the point of view of medical science, further, it has certainly provided the stimulus for more sustained, more concentrated, more widespread and more fertile medical research than any previous event in the world's history. At its close we may now perhaps take the opportunity of passing in review the stages in the development of our knowledge of the neuroses of war, a subject which has been productive of clinical investigation to a quite unusual degree. Before the war the categories covered by the clinically descriptive terms of neurasthenia, psychasthenia, and hysteria were well recognised and more or less well differentiated and accepted, in this country at least. Into this time-honoured scheme came with upsetting suddenness and momentum the new conception of "shell shock" as a clinical entity; old terms were given up, and "shell shock" represented the latest and all-embracing idea in the neuroses or psychoneuroses. Men came home with "shell shock" on their labels, and soon both the medical and the lay mind were permeated with it; it was the cause of every functional disturbance, mental or nervous, and special hospitals were rapidly organised for the reception of the "shell-shocked." Ere long, however, calmer consideration and more painstaking research showed that under the term was included a multiplicity of clinical conditions, most, if not all, of which seemed familiar enough. Somehow there was at first a disinclination to think of the soldier—the "old contemptible," the volunteer, the patriot—as a possible subject of ordinary traumatic hysteria; but that war hysterics, and malingerers, too, were appearing at base hospitals and in military hospitals at home could not be gainsaid. Gradually it came to be felt that "shell shock" was confusing by reason of its indefiniteness, and traumatic hysteria, traumatic neurasthenia, psychasthenia, and the rest seemed to come into their own again. If we mistake not, there is now appearing a tendency to group the war neuroses after the Freudian fashion, and to force them into the pigeon-holes labelled "conversion hysteria," "anxiety hysteria," and "anxiety neurosis."

But poor indeed would be the advance in our knowledge of the neuroses as the result of war experience were "shell shock" as a psychogenic or neurogenic factor to be minimised, or a sexual element in their genesis to be necessarily implied, by the adoption of a Freudian nomenclature. In our English fashion we have essayed a compromise between the old and the new, and many have come to regard the war neuroses as essentially identical with those of civil life, except in so far as the events of the battlefield are novel excitant factors and the instinct of self-preservation more potent than the instinct for the propagation of the species. The French, perhaps less apt than we to be influenced by precedent, less conservative, less bound by preconceived ideas, have divided the neuroses of war origin into "commotional" and "emotional" syndromes.[1] With that facility for new word-formations to which their language lends itself, they speak of the "commotionné," the "émotionné" and the "contusionné"; we have in the translation of our French Supplement followed tradition in rendering "commotionné" as "concussed," but have done so with regret. The *contusionné*, the patient with signs of local or general cerebral irritation and probably a somewhat blood-stained cerebro-spinal fluid, is, of course, clearly enough defined. The *commotionné* is the man who, after loss of consciousness from a shell explosion in his immediate vicinity, remains in a state of subcoma or obnubilation, with a variable degree of physical and mental inertia and of cerebral inhibition; his pupils are usually dilated, his pulse slow, and his reflexes diminished. The *émotionné*, on the other hand, does not as a rule lose consciousness in the strict sense (as Dr. C. VINCENT shows in his interesting paper published in our French Supplement); he has a quick pulse, moderate reflexes, and a pale, haggard or frightened visage; he trembles, and sweats; concentrated on his own *angoisse*, he is indifferent and inattentive to what goes on around except as it bears on his own safety and security. Such descriptions refer to the patients' states on their arrival at a C.C.S.; in the base hospitals the clinical appearances have changed to some extent. The *émotionné* has become a case of "emotion-neurosis"—like the anxiety-neurosis more or less; he is a pantophobe, with familiar psychical and physical symptoms. Or he may develop into an "emotion-neurasthenic" with physical and psychical overstrain, asthenia, and fatigability as the most prominent features. Or again, he may, ere he reaches the base, for that matter, have developed one or more of the pleomorphic manifestations of hysteria. Emotion-hysteria is common enough, but it should be clearly understood that hysterical phenomena do not form a constant and integral part of the emotion-syndrome, and may arise independently of emotional stimuli. It is comparatively rarely that the *commotionné* shows subsequent signs of hysteria; he remains, as a rule, an "inhibé," it may be, for months.

A schematisation of this sort may be perhaps rather cut-and-dry, and naturally cases presenting

[1] See in particular A. Léri, Commotions et Emotions de Guerre (Paris, Masson et Cie, 1918).

combinations of symptoms are met with; but it has much to commend it, and for practical purposes has proved, and is proving, useful and illuminating. And yet it leaves many problems unexplained, or at least only superficially elucidated—how much so can be gathered by a perusal of Dr. C. S. MYERS's interesting contribution in another column. Dr. MYERS indicates for us certain topics on which further investigation is desirable, and states that the mechanism of production of "functional dissociation" is still imperfectly understood. Emotion, suggestion, conflict (in a non-physical sense), maladaptation to environment, and so on, are factors whose evaluation remains to be determined. At this psychical end of the war neuroses there is, then, not a little for further research, in spite of the fact that in this country, as Dr. MYERS remarks and as we have always maintained, the mental aspect of the war neuroses has been elaborated at the expense of neglect of an equally detailed study of the accompanying somatic symptoms. Many have noted involvement of sympathetic, glandular, and reflex systems in emotion-neurosis and in emotion-neurasthenia, but only the fringe of the subject has been touched. Dr. MYERS pertinently asks whether functional dissociation may extend to these systems, and to what degree or "level." Similarly, in hysteria resulting from the war we should like to see more detailed investigation of the somatic and visceral accompaniments; so far from regarding such investigation as reactionary in view of the psychical nature of the affection, we feel that by it we should gain further insight into the extent of hysterical dissociation in somatic systems and learn useful criteria for diagnosis. It is not enough, in our view, to explore the recesses of the conceptual world by psycho-analysis or autognosis when the objective neural disturbances of the patient are analogous to what is found in certain endocrine affections or in certain organic conditions of the neuraxis. Dr. MYERS, albeit in an admittedly sketchy fashion, gives us enough clinical data for a realisation of the significance of investigation along such lines, and his contentions carry the more weight as coming from a professed psychologist. The varying orientation of our ideas on war neuroses during four years, apart from its intrinsic interest in the history of medicine, is of extrinsic importance for future diagnosis and treatment. Numerous, indeed, are the "unwounded wounded" at home or still abroad, and for a long time yet we shall have to deal with them therapeutically. To place them in their appropriate medical category is a matter of justice and equity; to separate the malingerer from the hysteric, the *commotionné* from the *émotionné*, the exaggerator from the *inhibé*, is a labour calling for knowledge and acumen. Treatment itself, as Dr. MYERS shows, has not been made a subject of systematic inquiry; successful workers, it is true, have published results in profusion, but there has been too little following up of cases for re-examination after an adequate interval. The war is over, but the physician's task is far from an end.

Lessons of the Influenza Epidemic.

Epidemiology and Clinical Aspects.

FROM our review of the etiology and pathology of influenza in last week's leading article the complexity of the problems involved is apparent, and it is obvious that further investigation is necessary for their solution. This is especially true of the epidemiological aspects of the disease which have not figured prominently in the various papers which we have published; nor is this surprising, since the materials necessary for the foundation of a considered judgment have yet to be assembled.

Epidemiology.

In the highly valuable discussion at the Royal Society of Medicine on Nov. 23rd last Dr. MAJOR GREENWOOD provided data from the records of the Ministry of Munitions and the Royal Air Force which suggested that the incidence curve of the summer outbreak was closely similar to that of the first pandemic in 1889–90 and that the secondary wave partook of the characters observable in 1891–92. These data were, however, incomplete. For instance, an epidemiological explanation of the relatively greater mortality at younger ages in the present outbreak remains to be found. The official mortality figures of the Registrar-General's 96 great towns display the asymmetrical character of the autumn epidemic very clearly. The maximum number of deaths—7557—occurred in the week ending Nov. 9th, having risen to this height from 1887 in the week ending Oct. 19th. The decline again to this level has been more gradual, almost the same number of deaths, 1885, being recorded in the week ending Dec. 14th. An examination of individual towns suggests that the maxima occurred earlier in the seaports, but it is impossible yet to correlate either the severities or the rates of temporal extension in the outbreaks with geographical and economic factors. A perusal of the clinical and bacteriological papers in our own columns alone suggests the desirability of investigators not delimiting the field of inquiry too narrowly. Dr. HAROLD WHITTINGHAM and Dr. CARRIE SIMS, for instance, in our issue of Dec. 28th, 1918, drew attention to the clinical differences of the summer and autumn outbreaks, and inferred that the causal organisms must have differed. The observation is, of course, a very familiar one in the history of epidemic diseases, and has been made with especial frequency relatively to scarlet fever; it would appear to be consonant with our experience of scarlet fever to infer that the variation is not so much of the causal organism as of secondary invaders responsible for sequelæ of the primary disease. Dr. WHITTINGHAM and Dr. SIMS also refer to the "distinct tendency when an epidemic disease is raging to assign all maladies to the one common origin," and we suspect that they deprecate this tendency; yet it may be the more or less conscious expression of an important epidemiological truth. The clinical convergence of disparate types of disease in a given year or cycle of years and the clinical divergences of the same disease at different epochs are the foundations of that doctrine of epidemic constitutions which held so prominent a place in the teaching of our first epidemiologist, SYDENHAM, and depended upon wide experience and accurate observation. The total discredit into which the old theory has fallen is, of course, due to the fact that the biological prophylaxis of clinically

convergent types, such, for instance, as typhoid and paratyphoid infections, is distinct. But a heterogeneity from this point of view does not invalidate the claim that from another point of view such a group of diseases is homogeneous; just as a sample of men may be heterogeneous in political opinions but homogeneous as regards their incomes or occupations. The point we are making is of much importance, and unless it be kept clearly in mind epidemiology becomes logomachy. We have to inquire in the first place whether in the late epidemics any general morbid process has developed, and, if so, whether it can be identified with any recorded before and whether its course has been significantly different from that of any previous epidemic.

"There are in truth varied constitutions of the years, not dependent upon heat or cold, dryness or moisture, but rather upon some hidden and inexplicable change in the very bowels of the earth, whence the air is contaminated by such effluviæ which predispose and determine towards this or that disease the bodies of mankind, so long as the dominion of the particular constitution endures, which constitution, its term having run, yields and gives place to another. Each of these general constitutions is characterised by a special fever peculiar to itself and not otherwise seen; such fevers we term stationary fevers."[1]

Unlike SYDENHAM, we should regard the hidden change as being within the field of possible epidemiological research and not rest content with a vague metaphor, but the idea at the back of the passage cited appears to us still fruitful, and attention should not be diverted from it by too sedulous pursuit of bacteriological details, important as these latter are from other points of view.

Clinical Aspects.

In its clinical aspects epidemic influenza has been characterised in past outbreaks by very varied manifestations, and attempts have been made to separate out different types of the disease with indifferent success. The epidemic at present so widely distributed is no exception to this rule; indeed, so protean have been its manifestations and so unequal its virulence, that some doubts have been expressed, chiefly in the lay press, as to the disease being influenzal in origin. Various fantastic theories have obtained a wide currency with little or no basis of support. One fact that seems to emerge clearly, through intensive study of the epidemic from the clinical and pathological points of view, is that the epidemic is influenza complicated by certain secondary organisms or infections. The complexity in the causation, which is suggested by bacteriological observations, may be, and probably is, an important factor in the variability of the clinical manifestations of the disease; with further correlation of the bacteriological and clinical observations the diversity of clinical types may find accurate explanation, and different forms of the disease may be associated with different secondary infections. The clinical features of influenza become somewhat more easy of explanation in the light of the pathological conditions observed in fatal cases, and these are admirably described in the paper by Dr. ADOLPHE ABRAHAMS, Dr. NORMAN HALLOWS, and Dr. HERBERT FRENCH, which we published on p. 1 of last week's issue of THE LANCET. They point out that even in the so-called pneumonic cases the lung lesions are only a part of the morbid changes usually found. They regard the fatal forms of the disease as a septicæmia of influenzo-pneumococcal or influenzo-streptococcal origin with more or less marked local changes in the lungs. The lung conditions found post mortem are even more varied than the clinical features of the disease, and comprise bronchitis, bronchiolitis, broncho-pneumonia, hæmorrhage, infarct, collapse, œdema, multiple abscesses, gangrene, interstitial emphysema; indeed, practically all possible morbid lesions except that lobar pneumonic consolidation is exceptional—a somewhat surprising fact in view of the physical signs, which frequently appear typical of this condition. The pleural manifestations are also variable, and range from localised dry pleurisy to large effusions of thin sero-purulent fluid. Without attempting enumeration of the lesions found, it is important to emphasise the frequency of renal changes, amounting to actual nephritis in a very considerable percentage of the fatal cases—a fact liable to escape observation clinically unless a routine examination of the urine is carried out, for œdema is absent. This is of especial importance in cases where convalescence is delayed. The pathological changes found allow little room for doubt that the fatal cases are of toxæmic or septicæmic character, and the discovery of organisms in the blood during life and in the internal organs immediately after death affords confirmation of this view.

A critical account of the symptoms of the disease will be found in the paper by Dr. FRENCH and his collaborators; but it may be worth while to point out that the character of the symptoms seems to differ in different parts of the country, and even in cases in the same place at different times. For example, some cases with pulmonary complications have been associated with an almost incessant cough, others with copious expectoration, while in some other cases with marked pulmonary involvement very little expectoration has occurred. Laryngeal, pulmonary, and lethargic varieties have been described. The types of case observed in the last few months have varied from mild febrile attacks associated with malaise, general pains in the back, limbs, and head, feelings of great prostration, thickly coated tongue, and almost complete loss of appetite, to fulminating cases fatal within 24 or 48 hours. A special feature, even of mild cases, in some parts of the country has been epistaxis, often frequent and copious. Other hæmorrhagic phenomena have been present in the septicæmic or pneumonic cases, including hæmoptysis and hæmatemesis. On the other hand, purpura seems to have been uncommon, although such might have been expected in the septicæmic cases. The colour of the patients with severe pulmonary complications is one of the features which has attracted almost universal attention, a peculiar dusky pallor, described as heliotrope cyanosis, being of most sinister prognosis, even though it may be present with only moderate pyrexia, a deceptively good pulse-rate, and not very extensive physical signs. The point is emphasised by the three observers just mentioned, who call attention also to the absence of orthopnœa and the comparatively slight degree of cardiac dilatation which may be present even in cases dying rapidly with marked cyanosis. These are points which strongly support the view of the septicæmic nature of the cases as opposed to the pulmonary origin of the symptoms. The frequency with which suppuration in the sphenoidal sinuses has been found in fatal cases, as well as the occurrence of severe epistaxis even in mild cases, and the existence of pharyngeal or laryngeal inflammations in some forms of the disease all serve to suggest that the channel of

[1] Sydenham: Observationum Medicarum, lib. i., cap. 2, par. 5.

infection is usually by the upper air-passages. The use of antiseptic gargles and nasal douches as a preventive appears, therefore, to be well founded, and the use of a gauze mask over the mouth and nose by nurses and medical men in attendance on cases in institutions seems a reasonable precaution. The physical signs in the pulmonary type of case are as variable as the other features of the disease. There may be general or local catarrhal signs, scattered patchy consolidation or signs strongly suggestive of lobar involvement, though they are in reality due to aggregations of broncho-pneumonic areas. Neither diagnosis nor prognosis can be gauged by physical signs too closely. In other cases signs of fluid may develop rapidly, but diagnosis of the lung or pleural conditions is often rendered difficult by variations in the physical signs from day to day. An interesting condition which has been observed in a few cases is subcutaneous emphysema —sometimes localised, occasionally widespread.

Treatment.

In regard to treatment no satisfactory routine measures can be said to have been discovered as yet. The various "specifics" suggested seem hardly to justify the claims made by their partisans. In all cases some such scheme of expectant and symptomatic treatment as that outlined by Sir THOMAS HORDER in THE LANCET of Nov. 23rd last should be adopted, and this with efficient nursing may be all that is required; but in the severe pneumonic, toxæmic, or septicæmic cases the therapeutic resources of the practitioner may be taxed to the utmost and yet fail, for some of the cases, notably those with the peculiar "heliotrope" cyanosis, seem all but hopeless. The question of treatment by vaccines and serums is still an open one. Evidence seems to be accumulating as to the value of prophylactic inoculation with mixed vaccines of the Pfeiffer bacillus, the pneumococcus and the streptococcus. We may hope that statistics on this question will be forthcoming eventually, and that the value of the procedure will be authoritatively appraised. Anti-streptococcus serum has been used by many observers in the toxic cases, but the results recorded seem to offer but moderate encouragement, though its use is rational in cases in which the presence of the streptococcus has been established. The use of vaccines in the treatment of the disease itself has been deprecated on the supposition that the induction of a negative phase might affect the course of the disease unfavourably. In a paper published in THE LANCET of Dec. 28th by Dr. W. H. WYNN this objection is denounced as theoretical, and the value of vaccines in acute influenza is strongly affirmed. This question, like many others, must be regarded as still *sub judice*, but we may hope that when the experience afforded by this epidemic has been collated some practical knowledge may result which, while not preventing further epidemics, at least will render them less serious in their effects.

Rabies and its Treatment in this Country.

OUR insular position and the spirited action of the Board of Agriculture under Mr. WALTER LONG resulted in the complete immunity of Britain from rabies for more than a decade. The faint academic interest felt for an infection occurring only on the continent has been violently stimulated by the recent outbreak of rabies in Devon and Cornwall. The airship and the dislocation caused by war conditions have made the rabies blockade ineffective, at all events for the moment, although no one will have any sympathy for the blockade-runner whose thoughtless selfishness may result in such terrible consequences to his countrymen. Hitherto anti-rabic treatment has not been available nearer than Paris, but Dr. EMIL ROUX, before relinquishing the office of director of the Pasteur Institute in Paris, with which he has been so long and honourably associated, rendered a very valuable service to this country by enabling anti-rabic treatment to be given with material sent over at frequent intervals from the institute to the Local Government Board. It is practicable, in the experience of the institute, to rely upon glycerine and cold to preserve the virus in a proper degree of potency for several weeks, and by these means to supply for use in this country spinal cords representing fixed virus of different ages, from which emulsions can be prepared and treatment can be given on lines parallel to those used at the parent institute. The Local Government Board have now announced to the local authorities of Devon and Cornwall that in place of the elaborate arrangements which had recently been made to facilitate the journey to Paris of persons known to have been bitten by rabid animals, anti-rabic treatment can in future be given at Plymouth, where the arrangements have been placed under the charge of Dr. W. L. PETHYBRIDGE, pathologist of the South Devon and East Cornwall Hospital. District councils are authorised in this connexion to pay reasonable sums for the maintenance in Plymouth of persons requiring treatment who cannot stay there at their own expense for the two or three weeks necessary for the completion of the course.

This provision of anti-rabic treatment is obviously necessary while cases of rabies in dogs and other animals continue to occur in these two counties. The disease has not disappeared, though there is reason to believe that the various restrictions on the movements and keeping of dogs, and the compulsory muzzling requirements of the Board of Agriculture, have already greatly reduced the opportunities of its spread, and apparently no cases are occurring outside the two counties named. It is understood that about 30 persons have actually been bitten by dogs definitely ascertained to be rabid since the outbreak was discovered. Nearly all of them have received anti-rabic treatment at Paris or at Plymouth, and it is satisfactory that no human case of hydrophobia has so far occurred. In their last Memorandum to the local health authorities, dated Dec. 31st, 1918, the Local Government Board state that the Board of Agriculture take steps to secure that the names of all persons known to their officers or to the police to have been bitten by dogs known or suspected to be rabid are at once communicated to the medical officer of health of the district. That officer communicates direct with the medical department of the Local Government Board, through which he learns of the facts regarding the dogs which have been ascertained at the laboratories of the veterinary officers of the Board of Agriculture, and obtains any further information available to guide him in deciding whether anti-rabic treatment should be advised. Where this advice is necessary the arrangements for treatment are to be made by the medical officer of health by direct communication with the pathologist at Plymouth, in order that the course of treatment may be started as speedily as possible.

Annotations.

"Ne quid nimis."

THE ETIOLOGY OF LINGUAL CANCER.

In his Bradshaw lecture on Cancer of the Tongue Mr. D'Arcy Power referred to the fact that it is almost entirely a human disease; it is always of one type; it is unknown in children; it is common in men, rare in women, and is not associated with any inherited predisposition to carcinoma. He gave an interesting description of the disease from the historical standpoint, pointing out that it did not become important surgically until the seventeenth century, the Greek, Latin, and Arabian writers on surgery hardly mentioning it, and so far as can be ascertained at present it is unknown to the Anglo-Saxons.

"The first definite notice of cancer of the tongue is the case of Ralph Freeman who died on March 16th, 1634, whilst serving the office of Lord Mayor of London. He suffered from secondary hæmorrhage and it was the opinion of the physicians and surgeons who were in attendance upon him that a mercurial course might have been of use at an earlier period of the disease. The second recorded case occurred in Germany, and was looked upon as a miraculous punishment for cursing the clergy. The story runs that 'lately a certain baron spoke abusively to all and sundry, but kept his most venomous shafts for the clergy and for those who devoted themselves to God's service. One day a holy brother of good repute whom he had just lashed said, "Your foul tongue has overlong deserved that punishment from an offended God which it will shortly receive." The baron rode off undismayed, but a few days later a small swelling began to grow at the side of his tongue. Little by little it increased in size until it became an inoperable cancer, and the baron, penitent and confessed, died miserably afflicted.' From the middle of the seventeenth century onwards cancer of the tongue became so frequent that it was no longer necessary to invoke a miracle for its production. At the present time cancer of the tongue is known to have occurred in one horse, three cats, and one dog. All these animals were aged, and in each the cancer was of the squamous-celled variety. It appears fair to assume, therefore, that lingual carcinoma has always occurred in men and domesticated animals; that originally in man it was no more frequent than it is now in animals; but that from the seventeenth century onwards it has increased out of all proportion in man, whilst the incidence has remained stationary in animals."

The returns of the Registrar-General were quoted in order to show the rate at which cancer of the tongue has increased in man. Dr. T. H. C. Stevenson, Superintendent of Statistics at Somerset House, writing in 1909, said that "the recorded mortality has increased amongst males by no less than 228 per cent. in 41 years. The increase, moreover, is entirely confined to the male sex." Mr. D'Arcy Power then considered the possible factors causing this increase, among which irritation had long been looked upon as important, and it has been suggested that pyorrhœa and dental caries have become more common. He thought that the virulence, but not the amount, of pyorrhœa seemed to have increased lately, whilst caries did not appear to be more frequent now than it was in some parts of England during the prehistoric period. Roman skulls found in England, he said, had nearly as many carious teeth as there are in the skulls of Londoners who died within the last 200 years, and if cancer of the tongue were the direct result of carious teeth the disease should have been as well known to the surgeons at Rome as it now is to us. But neither in Celsus nor in the Latin satirical poets is there any allusion to it. With regard to the question of syphilis being a predisposing cause, the lecturer gave, in discussing this point, an account of 169 persons who were admitted to St. Bartholomew's Hospital with cancer of the tongue during the years 1909–1916.

Nine of the patients were women, the rest were men, or a proportion of 18 to 1; the true proportion, as shown by the returns of the Registrar-General, being 1 woman to 8 men. Of the women seven were married, one was unmarried, and the social state of the other is not mentioned. Of the seven married women, one gave a history of syphilis, two showed signs of syphilis, and one was a widow who had only one child alive out of five; the note adds, "She looks as if she drank." One woman had leucoplakia of the tongue at the age of 17, and stated that her father had suffered from an "abscess of the brain" which was cured by medicine. This was probably a gummatous meningitis. There was no history of syphilis, either acquired or inherited, in the other two married women. The unmarried woman—a nurse—said that her father died of aneurysm, and that she herself had suffered from an abducent paralysis which came on suddenly and was cured by medicine. None of the women smoked, but all had bad teeth.

In the case of the men 93 out of the 160 were syphilitic, 62 gave a history of syphilis, and the remaining 31 showed signs of the disease, the syphilis being invariably of long standing. Twenty-six patients stated definitely that they had never had syphilis, but one of these had suffered from gonorrhœa, and the blood of two gave a positive Wassermann reaction. Many of the patients had drunk to excess, but did not, as a rule, acknowledge that they had taken spirits freely.

A Wassermann test had only been performed 26 times; it was negative in 12 and positive in 6 cases; in 5 it was doubtfully negative and in 3 doubtfully positive. These results were compared with those obtained by Captain Arnold Renshaw, R.A.M.C., of the Manchester University Medical School, and Captain Archibald Leitch, R.A.M.C. (T.), of the Cancer Hospital, Brompton, and it was thought that the evidence brought forward pointed to a close association between syphilis and cancer of the tongue. The syphilis might be active, but it was more often quiescent or even extinct, the conclusion arrived at being that, as in some cases of tuberculosis, "syphilis made the bed upon which cancer is born." It appeared, further, that an increase in the number of deaths from lingual carcinoma had occurred after periods when mercury had temporarily fallen into disuse in the treatment of syphilis. Such insufficient treatment was the rule in the later years of Queen's Elizabeth's reign, when guaiacum, sarsaparilla, and the "vegetable" cures displaced the original mercurial methods; as also during the Regency period, when some of the Army medical officers nearly succeeded in abolishing the use of mercury; and, again in the early Victorian era, when the value of potassium iodide was unduly exploited. Many of the patients whose cases were recorded at St. Bartholomew's Hospital stated voluntarily that they had only been treated with mercury for a fortnight or three weeks, after which they considered themselves cured.

Syphilis, Mr. Power concluded, could not be considered as more than a predisposing cause of cancer of the tongue, because lingual carcinoma occurred in animals. An exciting cause, therefore, must be looked for, and that cause ought to have become more prevalent during the last 50 years if the increase in cancer of the tongue was to be attributed to it. The cause must also be one which acts in men more than in women. He thought that the increased consumption of tobacco seemed to fulfil these conditions. Cancer of the tongue, he said, did not become frequent until some years after the introduction of smoking in the last quarter of the sixteenth century. The habit spread slowly during the seventeenth, eighteenth, and nineteenth centuries. Cigarettes were introduced about 1877, and from that time onwards the smoking of tobacco has steadily increased until it is now an almost universal habit with both sexes from adolescence onwards. Smoking acts in two ways as an irritant to the tongue, partly through the nicotin and partly by the increased heat in the mouth, which is measurable by the thermometer. In the latter respect it may bear the same relation to cancer that heat does in kangri cancer, where the thermal irritation appears to be a definite factor in the production of epithelioma. Although the predisposing and the exciting causes of cancer may be

known, the actual cause has yet to be discovered, but if two factors are recognised it ought not to be impossible to discover the third. It is theoretically possible to reduce cancer of the tongue to the subordinate position it occupied before the seventeenth century and which it still holds in the domestic animal, and this could be effected by a thorough treatment of syphilis in its initial stages. Persons who were being treated for syphilis should be told never to smoke, not to drink to excess, and to pay regular visits to the dentist. Such advice should be given whilst the patient is still under treatment, and should not be deferred until the tongue has become sore. Failure to follow this advice and a continuance of the treatment of syphilis on ineffective lines will be followed in all probability by a very large increase in the number of patients with cancer of the tongue. This increase should begin about 1950, and should affect women as well as men, for syphilis is now more widely spread amongst the younger generation than it has been for many years past, and both sexes smoke much larger quantities of tobacco than ever before.

MOTOR MECHANICS FOR CRIPPLES.

MOTOR mechanics is proving in the Dominions, as here, a popular subject of instruction for crippled soldiers on their way to become self-supporting workers. Mr. Douglas C. McMurtrie, director of the Red Cross Institute for Crippled and Disabled Men in New York City, writes that the trade is almost too popular in the Canadian schools. Practically every Canadian soldier, when asked to choose from among the various trades in which classes are held, selects automobile mechanics. Most of the men now have to be dissuaded from their intention or the supply of mechanics would soon far exceed the demand. Canada, England, Germany, and India amongst the belligerents are offering training courses in motor mechanics to disabled men of their own forces, and America is falling into line. At the large reconstruction hospital at Fort McHenry, for instance, automobile mechanism is taught, and one-armed or one-legged mechanics will be no new thing once the general public has accepted the principles of re-education. In British Columbia gasoline engine classes were organised soon after the wounded began returning from overseas. Vancouver, Victoria, Esquimalt and Westhaven provide instruction in motor mechanics. In Victoria the Military Hospitals Commission and the Board of Education together operate a fully-equipped motor repair-shop in which men who wish to become chauffeurs are taught. Men trained in this course conduct a well-patronised taxi-stand in the town. Those who wish a thorough course in motor mechanism are sent to Vancouver, and later to the new workshops at Esquimalt and Westhaven. The Commission has arranged for war cripples at Vancouver to be taught driving in the evening classes of an excellent automobile school. At this school any disabled soldier may attend the day classes free of charge. Men from other parts of British Columbia are kept in Vancouver on a maintenance allowance while receiving training. Courses are also given at the University of Saskatchewan, and at the Provincial Institute of Technology and Art in Calgary. In this country, as is well known, the workshop at Roehampton is fitted up as a model garage in charge of disabled men who, besides being skilled instructors, understand the special problems of the war cripple. At Dusseldorf the course in automobile mechanics was established at the request of the motor repair-shop owners, who needed workmen and could not obtain able-bodied men. Within a very few months of its inception the pupils had successfully repaired 14 different types of motors. In India Queen Mary's Technical School in Bombay gives opportunity for the study of automobile mechanics by the crippled natives, whose imagination has been roused by this method of equalising their physical handicap.

THE NOTIFICATION OF ENCEPHALITIS AND POLIOMYELITIS.

To those who have made a study of epidemic disease the decision of the Local Government Board to make acute encephalitis lethargica notifiable is a source of very real pleasure. It is all to the good that the hands of the public health authorities should be strengthened in respect of this disease, and there is much significance in the fact that although it has been discovered so recently it is already included in the list of diseases dealt with under the Public Health Acts. The advantages of notification as the fundamental step in the elucidation of the problems of infectious disease in general appear now to have been fully recognised, and the arduous labour which attended the struggle to get acute poliomyelitis on the list is bearing fruit in another direction. Judging by past experience there is the possibility of a recurrence of encephalitis lethargica in the spring, and the medical profession will not be caught unprepared for the visitation. The general characters of the disease, at any rate in its more striking forms, have been brought prominently before the profession in our columns and elsewhere. With information of the occurrence of cases at their disposal the authorities will be able to coördinate research, and the discovery of the cause of the disease, which is the first step towards rational treatment, will be advanced.

SPANISH-AMERICAN MEDICAL FELLOWSHIP.

THE spirit of friendly coöperation has invaded medical circles on both sides of the Atlantic, and one of its latest developments is the proposed issue of a Spanish edition of the very ably edited *Journal of the American Medical Association*. The purpose of the issue is to promote the study of scientific medicine, and in so doing to further a closer international relationship between the great federation of English-speaking states in the North and the looser union of Spanish-speaking republics in the South. Last March President George E. Vincent, of the Rockefeller Foundation, approached the editor of the *Journal of the American Medical Association* with a suggestion on the subject, and at a subsequent meeting of the board of trustees of the journal the publication of a Spanish edition was authorised. The first number is arranged to appear early in the present month, and the issue will be continued, for the time being, twice a month. All that is of more general interest and permanent value in the weekly Chicago edition will appear in the Spanish issue. Some 2000 medical practitioners in Central and South America have been asked for their opinion as to the reception such a journal would meet with, and all the replies as yet received have been favourable. Up to the present Mexico and South America have been wont to turn to France and Germany for undergraduate and post-

graduate teaching, and to take from them their inspiration towards progress. This new venture may lead the scientific men generally of the American Continent to realise their identity of interest and to open up opportunities for interchange of knowledge and of the results of research in various fields. We do not construe it in the sense of a rigid application of the Monroe doctrine. Certain standard English text-books of medicine have already been translated into Spanish, and we should like to see this peaceful form of penetration continue and develop.

PARALYSIS AGITANS AND THE CORPUS STRIATUM.

IT appears that we are within a measurable distance of an understanding of the pathology of this chronic nervous syndrome. In an interesting paper by Dr. J. Ramsay Hunt in the *Archives of Internal Medicine* (November, 1918) this writer records in full detail the morbid findings in two cases of paralysis agitans; in both the sole lesion was found to be a primary atrophy of the pallidal system of the corpus striatum. The corpus striatum in man is divided by the passage of the internal capsule into two structures, the caudate nucleus and the lenticular nucleus. The latter is subdivided into an external segment, the putamen, and an internal, the globus pallidus. The globus pallidus is older phylogenetically than the caudate nucleus and putamen (neostriatum). It is also distinguished from these structures histologically. The neostriatum contains two types of cells, a small type of ganglion cell of pyramidal form, and a large type of ganglion cell, the homologues in the corpus striatum of the Betz cells in the motor cortex; the globus pallidus contains only these latter large cell types. By the course of the fibres related to these two cell systems their functional significance can be inferred. The small-cell fibres end in the globus pallidus; they constitute a short association and inhibitory system for the corpus striatum, and atrophy of this system is the essential cause of Huntington's chorea (Hunt). The large-cell fibres, on the other hand, have a wider distribution; they extend to the optic thalamus, constituting the efferent pallidal system, and exert, through the red nucleus and substantia nigra, a regulating influence upon the extra-pyramidal motor system of the spinal cord. Lesion of this pallidal system results in paralysis agitans. The corpus striatum and the strio-spinal system are to be regarded as constituting a mechanism for the control and regulation of automatic and associated movements, paralysis of which results in the syndrome of paralysis agitans; in this sense it is to be distinguished from the other type of central palsy characterised by spastic paralysis, a paralysis here of isolated and discriminatory movements, and referable to damage of the pyramidal system.

The two cases recorded confirm these views as to the pathology of paralysis agitans. In the first, that of a man aged 56, who died of an intercurrent infection, there were found atrophic changes in the large motor cells of the neostriatum, with slight reduction of the medullary network of the globus pallidus and thinning of the strio-hypothalamic radiation. The second case showed atrophic changes in the large motor cells of the corpus striatum and other changes in the globus pallidus similar to those met with in the first case. There were no other evidences of central nervous involvement in either case. Dr. Hunt discusses the causation of the symptomatology. The rigidity and tremor are referred to a loss of striatal inhibition, the corpus striatum controlling muscle tonus as does the cerebral cortex. When this inhibitory function is abolished hypertonicity results. The striated muscle has a double innervation—the anisotropic disc system controlled by the motor nerves, and the sarcoplasmic substance controlled by the sympathetic system. The former subserves the function of quick contraction; the latter, plastic function concerned in posture. It is suggested that there exist two distinct centres for the control of muscle tonus—one for contractile tonus, which regulates the anisotropic disc system, the other for the plastic tonus. Both centres are under the control of the pallidal system, and loss of this control may be indicated by tremor or rigidity according to the system involved.

THE FUTURE OF THE V.A.D.

Now that hostilities have ended and the women of the Voluntary Aid Detachments are being demobilised, the question arises as to how we can assist them in qualifying for some useful career. Many of them are women of the educated classes who have given up the work which they had already entered upon in order to help the country in its great need: others were living a life of leisure and amusement when the call came. All have answered nobly; in the one case careers have been cut short, in the other the women have become imbued with the ideal of a life of activity and of usefulness to their fellows such as would not have dawned for them had there been no "Great War." It is with the endeavour of helping these women that Lady Ampthill, chairman of the Joint Women's V.A.D. Committee, has initiated a scholarship scheme, and the Joint Committee of the British Red Cross is contributing a sum of money "as a tribute to the magnificent work so generously done by V.A.D. members during the war." Various spheres of work are suggested, for which scholarships will be given which are likely to prove attractive to different types of mind. The list, which makes no pretence to be complete, includes: medicine; nursing (military, naval, and civil); district nursing; village nursing; midwifery; school nursing (elementary schools); nursery nursing; school matrons; physical culture; instructors of mental defectives; pharmacy; X ray assistants; dentistry; domestic science; institutional cookery; sanitary inspectors; health visitors; welfare supervisors; hospital almoners; and infant welfare workers. Many V.A.D.'s have given yeoman service in domestic capacities and have proved their worth as cooks. Those who have given their time to nursing and other work of a medical character may wish to continue along the same lines. For many years the conditions and prospects of a nurse's life have not in general been such as to attract the best class of woman. The hours are long, the work is arduous and exacting, the pay is poor, and the prospects are uninviting. Anyone can be, or call herself, "a nurse," there is no definite qualifying standard, and consequently the position, when attained, is to some extent spoiled of the honour which is its due. There has never before been such a harvest of well-bred, well-educated women for the hospitals to garner if they can. But infant welfare work, domestic science, teaching, and many other attractive occupations are competing. Is it too much to suggest that the nursing profession should take this occasion to put its house

in order? The Great Northern Hospital has just given a lead by raising the scale of remuneration to ward and theatre sisters. Another London hospital is planning its nursing on three shifts instead of two. But much more remains to be done before nursing becomes a career to which we shall gladly commend our daughters, instead of a self-sacrificing adventure which they themselves choose, and one fit only for altruists.

THE DEATH-RATE OF MENTAL DEFECTIVES IN INSTITUTIONS.

IN noticing the annual report of the Royal Earlswood Institution for Mental Defectives in a recent issue (THE LANCET, 1918, ii., 656) we commented upon the excessively high death-rate recorded at the institution during the year 1917. Calculated on the average number of residents, this rate amounted to 81·5 per 1000. The medical superintendent of the institution, Dr. Charles Caldecott, informs us that the high death-rate is the product of several causes. In the first place, a large number of patients were elected many years ago to be maintained in the institution for life, and although on any average expectation of life these patients would have died off some years ago, there are, in fact, 20 to 30 of them still alive, and the death-rate is therefore each year unduly loaded by these survivals. During 1917, 16 of the recorded deaths occurred amongst such "life" cases. In the second place, asylum populations have not escaped the epidemics of the last two years. During 1916 a severe epidemic of scarlet fever occurred with about 70 cases; in 1917 an epidemic of measles with a total figure of 150 cases. These two epidemics, in Dr. Caldecott's opinion, left the convalescents more liable to general diseases, especially tuberculosis, and the latter was, in fact, the cause of about one-half the deaths. Added to this the stringent regulations respecting the lighting in force during the latter part of the war necessitated the closing of windows and ventilators or the close curtaining of windows, with resulting lack of fresh air and its invigorating qualities. The rationing of staple articles of diet doubtless had an undue effect on the conservative taste of institution patients and tended further to undermine their constitutions. Accepting this analysis as true in measure of the high death-rate of mental defectives, it will be seen that part of it is apparent, part irremediable, and part—possibly a considerable part—due to removable causes, some of which have already been removed. As with statistics in general, careful sifting is required to bring out any useful lesson.

MEDICAL INFLUENZA VICTIMS IN SOUTH AFRICA.

IN South Africa, as elsewhere, doctors and nurses have been endeavouring to stem the tide of the influenza epidemic, and many have succumbed to the disease, their death in some cases having been caused or hastened by overwork. Dr. Charles Howard Spaulding, of Johannesburg, who had been working at high pressure for several weeks, refusing to relinquish his professional duties although advised to do so, died in October at the age of 51 years. He was an M.D. of Chicago, who went out to South Africa in 1892. James Alexander Thwaits, a surgeon, who died on Oct. 11th, was the son of a Cape Government surveyor, and was born at Beaufort West in 1870. He was educated at the South African College, Cape Town, qualified at Edinburgh, and served as senior medical officer with Kitchener's Horse for two years during the Boer war. Dr. William Mortimer died of influenza at Potchefstroom on Oct. 24th. He was born at Port Elizabeth in 1864 and was educated at St. Andrew's College, Grahamstown, and Diocesan (Bishop's) College, Rondebosch. He entered the London Hospital Medical College in 1883, securing the Conjoint Diploma in 1887. He took a deep interest in public affairs, was town councillor in Potchefstroom from 1905–06, and again from 1907–09, and was elected Member of the Legislative Assembly for Potchefstroom in 1907. Lieutenant-Colonel H. S. van Zyl, who, at the time of his death, was in command of No. 2 General Hospital, Maitland, Capetown, was, as his name implies, of Dutch descent. He was medical officer to General Botha during the Boer War of 1899–1902, and had been on active service since the Boer rebellion of 1914. Dr. A. S. Kuny died of pneumonia at the New Somerset Hospital, Capetown, where he was one of the resident medical officers, on Oct. 17th. He was the son of Dr. Kuny, of Volksrust, Transvaal, and was 26 years of age. He qualified at Edinburgh in 1915, and had served in the R.A.M.C. in Flanders for two years before returning to the Cape last August. The medical men who remain have been terribly overpressed, and some who had retired have returned for the nonce to active practice. The Hon. Sir Thomas Smartt, a Member of the Legislative Assembly since the retirement of the late Sir Starr Jameson, and Leader of the Opposition in the Union South African Parliament, who qualified in 1878, has during the epidemic been carrying out inoculations at Stellenbosch. It is not alone the human population which has suffered in South Africa; baboons and monkeys also appear to have fallen victims. Farmers in the Hekpoort district state that hundreds of baboons have been found lying dead in the kloofs and along the roadside, whilst monkeys are reported to have succumbed in the Cape Province. Witch doctors are reported to have been kept busy, with what success does not appear. Some of the Orange Free State natives are refusing medicine and pinning their faith to their ancient methods. This is natural, as medical science has not in this field shown anything very striking to compete with necromancy and sorcery.

Sir John Goodwin's tribute to the temporary officers of the Royal Army Medical Corps will be found on p. 84.

SIX Hunterian lectures will be delivered at the Royal College of Surgeons of England on Phases in the Life and Work of John Hunter, by Professor Arthur Keith, Conservator of the Museum, at 5 P.M. on Mondays, Wednesdays, and Fridays, commencing Jan. 20th. The dates will be announced in our Medical Diary from week to week.

IN a further list of New Year Honours, announced as we go to press, are the names of three medical men upon whom a well-deserved Knighthood of the British Empire has been conferred—namely, Dr. Edward Napier Burnett, chairman of the Economic Committee of the Army Medical Department; Dr. G. Archdall Reid, F.R.S.E.; and Dr. William Hale White, chairman and consultant to Queen Mary's Royal Naval Hospital at Southend. Other appointments to the Order appear under the heading "The War and After" or will be given next week.

Correspondence.

"Audi alteram partem."

"HETERÆSTHESIA."

To the Editor of THE LANCET.

SIR,—In connexion with Major D. W. Carmalt Jones's paper, "Sensory Changes in the Diagnosis of Trench Fever," which appeared in THE LANCET of Oct. 5th, we think that our own observations on a somewhat similar phenomenon may be of interest. We originally found that in a case of Brown-Séquard paralysis the phenomenon of allocheiria occurred at segmental boundaries when one electrode of the faradic battery was drawn across the skin upon the side of the body which exhibited sensory changes. In this manner we were able to map the segmental areas upon the whole of the left side of the body from the level of the second thoracic segment downwards, but were unable to find any corresponding phenomenon upon the right side of the body. This latter fact and the precautions which we took negatived the possibility of "suggestion." Having found this phenomenon accidentally, we proceeded to look for similar phenomena in other conditions. We found that when the unipolar faradic electrode is drawn over the skin (a pin may be used with less satisfactory results) in certain neurological conditions the patient responds either by a movement or by speech when cutaneous lines (which seem to be segmental or radicular) are passed across. His response indicates that the apparent sensory value of the stimulus (which varies in locus but not in strength) changes as the electrode passes across the line. The change may be in either direction—increase or decrease. The conditions in which we discovered this phenomenon are: concussion of the brain with fracture of the base of the skull; concussion of the spinal cord from the graze of a live shell; true shell concussion. In these states the phenomenon is transient—disappearing in a few days or weeks.

In many individuals it is extremely easy to obtain the phenomenon by "suggestion" even when it is thought that suitable precautions are being taken to prevent this. The drawing of a line upon the skin with a blue pencil in itself suggests to the patient where the next change should be felt, and we have found in our practice that it is advisable to mark points of change with dots, and to pass haphazard from one part of the body to another, finally joining the dots with lines for permanent record by photography. Where a line of change is being investigated it is essential to start the electrode at different distances from the expected line and to move it at an even rate over the skin. After using every precaution we are certain that the phenomenon as it occurs in such cases is a true one, and not due to "suggestion."

We would like to propose the term "heteræsthesia" for the phenomenon. As the lines of change do not, in our experience, mark a constant variation in sensibility (for at one time the line of change may be one at which the sensation is apparently intensified, while at another time, the electrode being drawn in the same direction across it, the change may be one of diminution) it has occurred to us that the phenomenon may be due to the disturbance of a higher mechanism which normally tends to adjust the excitabilities of the spinal segments, and, when disturbed, may allow those excitabilities to have greater than normal variation amongst themselves.

We have had the advantage of controlling our results in a large number of cases, many of whom have had malaria, and can say definitely that it is not necessarily present in men who have had malaria without concussion. But we have not examined cases of malaria during the fever or immediately after it. We have to a certain extent relied on this phenomenon of "heteræsthesia" in the diagnosis of shell concussion.

It would be interesting to know what Major Carmalt Jones's experience is with regard to the relation of the phenomenon to the period of fever and with regard to the duration of the phenomenon after the fever has ceased. We hope that a short paper which we wrote last year on this phenomenon as it occurs in neurological cases will shortly appear in another journal.

We are, Sir, yours faithfully,

T. GRAHAM BROWN.
R. M. STEWART.

Neurological Department, B.S.F.,
Nov. 1st, 1918.

ANTIMONY IN BILHARZIOSIS.

To the Editor of THE LANCET.

SIR,—I have read Mr. J. E. R. McDonagh's note in THE LANCET of Sept. 14th. Nothing is new in medicine, and I dare say that tartar emetic (antimony tartrate) has been used many times for bilharzia, especially in days gone by before tartar emetic fell into disrepute. I have not seen Mr. McDonagh's book.

In May, 1917, after making a trial of antimony tartrate by intravenous injection for leishmaniasis (kala-azar, espundia, tropical sore, all of which are found in the Sudan), and finding it, as other workers had found before, a specific, I began to try it for the *Schistosomum hæmatobium* (Bilharz), and found it equally successful, and we have since used it as routine treatment and have still the treatment under trial at the Khartoum Civil Hospital. I hold the same opinion about it as I did at first—that it is a specific cure for bilharziosis. My work was original, and has been, independent of anyone else's work and quite spontaneous, and I had never read of, or heard of, or dreamt of any other worker having before tried antimony for bilharzia.

Although I had written my paper considerably before I despatched it to THE LANCET on June 2nd, it was published on Sept. 7th, 1918. I have now had one and a half years' experience of cases under the treatment, and think it will prove a great benefit to the people of Egypt. If they can get rid of the scourge of bilharziosis the Egyptians will become a clear-complexioned, rosy-faced race. One of the most striking features of the treatment is the change from the muddy, sallow face to a healthy, pink, clear complexion. I intend to publish more observations on the treatment shortly, but there is no hurry.

I may say that antimony tartrate for bilharziosis is under trial at the Egyptian Army Military Hospital, Khartoum, and I hope that Major Innes, R.A.M.C. (T.), who is interested in the treatment, and who is carrying it out with the caution and patience and with all the splendid critical qualities of the Scottish race which have made its scientific work so valuable, will have something favourable to put on paper soon.

I am, Sir, yours faithfully,

J. B. CHRISTOPHERSON, M.D.,
Director, Khartoum and Omdurman Civil Hospitals.

Khartoum, Sudan, Nov. 20th, 1918.

EPIDEMIC ENCEPHALO-MYELITIS AND INFLUENZA.

To the Editor of THE LANCET.

SIR,—It seems worth while, at the risk of being wearisome, to draw attention to the increasing volume of testimony that points to the essential unity of epidemic encephalomyelitis (in the epidemiological sense at least) with epidemic influenza. In this connexion the recent paper by Dr. Smith Jelliffe,[1] and the remarks of Dr. Beates,[2] as well as the observations of Sir Thomas Horder[3] concerning the present prevalence of poliomyelitis, are of very great importance. Professor Chartier[4] has discussed, with delicate irony, the claims of "encephalitis lethargica" to be considered an autonomous affection, and hints, not obscurely, that it is really "*une variété symptomatique d'une infection générale telle que l'influenza.*" In a paper read by me a week or two ago before the Section (of the Royal Society of Medicine) for the Study of the History of Medicine, I gave many historical records of epidemics of encephalitis, encephalo-myelitis, and poliomyelitis, definitely associated with epidemics of influenza. But though Brorström, in 1910, first showed the relation between poliomyelitis and influenza it is Dr. Hamer who, above all others, has insisted on the importance of recognising the epidemiological association between these various epidemic prevalences generally.

As Lombard, of Geneva,[5] wrote many years ago:—

La grippe est souvent precédé par une constitution eminement nerveuse, dont les caractères principes sont de porter la trouble dans les fonctions du cerveau et des nerfs encéphaliques.

In 1837, too, the "apoplectic" forms of encephalitis on which Dr. Farquhar Buzzard has justly laid so much stress were observed by Récamier and others, while Gintrac, of Bordeaux, described in the clearest manner "epidemic stupor" in

[1] New York Medical Journal, 1918, ii., 757, 807. [2] Ibid., 922.
[3] THE LANCET, 1918, ii., 874.
[4] La Presse Médicale, Dec. 23rd, 1918, 660, 661.
[5] Gaz. Méd., 1833, 729, and 1837, 214.

children; all this occurring, in Malcorps' words, amongst the "prodromes nerveux" of the epidemic influenza of that year.

Surely then, as Chartier says, if "encephalitis lethargica" is to take place as an autonomous affection, "il serait important de fixer nettement les limites et les caractères différentiels de cette maladie."

I am, Sir, yours faithfully,

Harley-street, W., Jan. 3rd, 1919. F. G. CROOKSHANK.

RESIDENTIAL TREATMENT FOR PREGNANT WOMEN SUFFERING FROM VENEREAL DISEASES.

To the Editor of THE LANCET.

SIR,—In an annotation on the Prevention of Syphilis among Infants in your issue of Dec. 28th last reference was made to work done by the London Hospital, Whitechapel, and the Thavies Inn Venereal Centre for Pregnant Women, and it was stated that the London Hospital Venereal Department and the Thavies Inn Venereal Centre provided the only residential treatment in the metropolis for pregnant women suffering from venereal disease.

We have been desired by the board of management of the London Lock Hospital to write saying that this is incorrect, as since May, 1918, the London Lock Hospital has had a large maternity department open and working at the Harrow-road institution. During the period from May to December, 1918, 68 married and unmarried pregnant women have been admitted and treated and 42 women delivered, of whom 20 were suffering from syphilis and 22 from gonorrhœa, and 43 babies have been born.

We are informed by Mr. Charles Gibbs, F.R.C.S., and Mr. Arthur Shillitoe, F.R.C.S., honorary surgeons at Harrow-road, that all our pregnant syphilitic patients have a full course of "606" before their confinements. The results are most gratifying, as a large proportion of these women give a negative blood test before confinement and are delivered of children with a negative reaction.

In conclusion we wish to state that intravenous injections of "606" have been given to expectant mothers and babies admitted to the Lock Hospital since February, 1916, and it must be noted that the figures given above only refer to the period May to December of last year.

We are, Sir, yours faithfully,

KINNAIRD,
Chairman of the Board,
J. F. W. DEACON,
Deputy Chairman of the Board.
J. ERNEST LANE,
Chairman of the Medical Committee.

London Lock Hospital and Rescue Home, Harrow-road, London, W., Jan. 3rd, 1919.

*** We are glad to hear of 42 other women offered efficient treatment in their desperate extremity. But the need must be tenfold greater than the accommodation, and this was the main lesson we wished to draw.—ED. L.

ADVANCES IN THE TREATMENT OF FRACTURES.

To the Editor of THE LANCET.

SIR,—Several letters have appeared in the columns of THE LANCET under the above heading emphasising the great work carried out by Major M. Sinclair in his method of extension and immobilisation of fractures of the long bones. It may appear to be ungracious to offer any criticism when the results obtained are so good as far as the length and the alignment of the fractured bone are concerned, but in many cases treated by prolonged immobilisation by Major Sinclair's method there remains a considerable degree of limitation of movement in the joint below the fracture. In the case of the fractured femur this has been overcome by the method devised by Major Besley and subsequently modified by Major W. Pearson, by which the extension is made directly to the lower end of the femur by means of pointed callipers, whilst movement is made frequently in the knee-joint without any interference with the fracture. Major Sinclair's net-frame is of great advantage when, in addition to the fractured femur, there are wounds in the buttock, or when abduction is required, but the arrangement of the more recent fracture bed devised by Major Pearson allows of an equally simple dressing, &c., without the disadvantages of a special and somewhat cumbersome apparatus.

However, the greatest credit must still be given to Major Sinclair as the originator of methods, even if certain modifications of these methods have been found more efficacious in some forms of fracture.

I am, Sir, yours faithfully,

R. H. JOCELYN SWAN,
Major, R.A.M.C.; Consulting Surgeon, Woolwich District.

Jan. 6th, 1919.

THE CAUSES AND INCIDENCE OF DENTAL CARIES.

To the Editor of THE LANCET.

SIR,—In his letter on this subject published in THE LANCET of Jan. 4th Dr. Harry Campbell states: "I have again and again referred to the prosaic fact that there are among the inhabitants of this country some 200 million carious teeth, as many alveolar abscesses (pyorrhœa alveolaris), and some 30 million root abscesses." I presume that Dr. Campbell will not object to furnishing some evidence of this "prosaic fact" (?) for the benefit of your readers, many of whom are (like myself) deeply interested in the subject.

I am, Sir, yours faithfully,

R. DENISON PEDLEY.

Railway Approach, London Bridge, S.E., Jan. 6th, 1919.

THE PRACTICE OF THE ABSENTEE.

To the Editor of THE LANCET.

SIR,—I cannot understand Dr. F. R. Mallett's indignation with the letter of Dec. 28th, 1918, signed "Major, R.A.M.C. (T.C.)." I am a doctor in general practice who has been to the front and returned to practice. I find on my return that several of my former patients are being treated by professional brethren who remained at home; these patients are not asked if they wish to return to me. There being very little opposition, the doctors who remained at home charged high fees, frequently demanding the money before they left their houses. My midwifery cases who had "booked" the other doctors are not returned to me. New panel patients, who in the ordinary course would have come on my list, have been put on the lists of the doctors who remained, and every difficulty is put in the way of their coming to me.

The doctors who remained at home opened during my absence a surgery within half a mile of my house. It is still open. These tactics will not pay in the long run, but it is a little irritating to those who have undergone the hardships of active service and who have been under shell fire to hear so much about "the overwork" of those who stayed safely at home and who probably earned twice their usual incomes. I would suggest that these overworked gentlemen should join the R.A.M.C. for the demobilisation and so allow their brethren who have been to the front to come back at once and start their practices with less opposition.

I am, Sir, yours faithfully,

Jan. 6th, 1919. TEMP. R.A.M.C.

To the Editor of THE LANCET.

SIR,—With reference to the correspondence in THE LANCET on the above subject, may I state my own case as I have just been demobilised after 20 months' service? I arranged with a neighbour to carry on in my absence, the receipts to be divided between us. There was very little panel (only 100), the rest being private work. The practice is an old-established one, and has never done less than £1000 per year. At the time of handing over there was a visiting list of 20 per day; when I returned I was given a list of six patients *only*, not six per day. During the whole of this time I have received exactly £42 from the private part of the practice and about an equal amount from the panel, which has, of course, steadily got less. My rent and rates are £75 per year, so that had the war continued a little longer I should have been compelled to either give up the house or file my petition.

However, I am so pleased to be back comparatively sound that I do not complain, and if I can only manage to get through this year without getting very much into debt I shall indeed be a happy man. I don't blame anyone, least of all the practitioner who has carried on for me, as

patients naturally go to whom they fancy, and, so long as human nature is as it is, will not always say that they are someone else's patients. Mine may be an extreme case, as upon one occasion I was officially reported killed in action and upon another died after being wounded.

I am, Sir, yours faithfully,

Jan. 6th, 1919. DEMOBILISED.

PURULENT BRONCHO-PNEUMONIA ASSOCIATED WITH THE MENINGOCOCCUS.

To the Editor of THE LANCET.

SIR,—In your issue of Dec. 28th, 1918, Captain J. A. Glover publishes a note describing six cases of broncho-pneumonia. His article bears a title which is wholly misleading. Looking at the heading, and knowing that Captain Glover had charge of the C.-S. Fever Laboratory for the London District, one would expect to find on reading the article that he would bring forward proof of the meningococcus causing broncho-pneumonia. But he does not do so. He simply describes broncho-pneumonia occurring in six patients, three of whom undoubtedly "carried" the meningococcus in their naso-pharynx. Captain Glover quotes notes from Dr. T. H. Jamieson describing the six cases and stating that "examination of the sputum showed pneumococci." Post-mortem examinations were done on two cases, yet nothing is stated concerning the bacteriology of the broncho-pneumonia found. Captain Glover then states that in his opinion the broncho-pneumonia was probably due to a mixed infection of pneumococci or Pfeiffer's bacillus and meningococci.

Captain Glover is entitled to have his opinion, but before it can be accepted by others he must bring forward proof. Although three out of six cases of broncho-pneumonia were found to be "carriers" of the meningococcus in their naso-pharynx, this is no proof that the broncho-pneumonia was due to this organism. The pneumococcus was found in the sputum in all the cases, and efforts to isolate the meningococcus from one case failed. Even had Captain Glover isolated the meningococcus from the sputum this would not exclude the naso-pharynx as the source. Further, Captain Glover gives no bacteriological proof whatsoever for bringing Pfeiffer's bacillus into the cases. We still await definite bacteriological proof that the meningococcus can cause pneumonia. Captain Glover has not supplied it, and we cannot therefore accept his opinion.

I am, Sir, yours faithfully,

Jan. 4th, 1919. BACTERIOLOGIST.

A MONTHLY RECORD OF ATMOSPHERIC POLLUTION.

METEOROLOGICAL OFFICE: ADVISORY COMMITTEE ON ATMOSPHERIC POLLUTION: SUMMARY OF REPORTS FOR THE MONTHS ENDING

Feb. 28th, 1918.

Place.	Rainfall in millimetres.	Metric tons of deposit per square kilometre. Insoluble matter. Tar.	Carbonaceous other than tar	Ash.	Soluble matter. Loss on ignition.	Ash.	Total solids.	Included in soluble matter. Sulphate as (SO_3).	Chlorine (Cl).	Ammonia (NH_3).
ENGLAND.										
Leicester	38	0·33	4·92	6·89	2·37	11·25	25·74	7·00	0·34	0·10
London—										
Meteorological Office	21	0·11	1·83	3·89	1·26	2·52	9·61	0·90	0·41	0·03
Embankment Gardens	34	0·14	3·65	6·48	5·37	10·85	26·49	5·93	1·70	0·19
Finsbury Park ...	37	0·15	1·50	6·01	3·49	6 52	17·68	4·40	0·65	0·06
Ravenscourt Park	23	0·09	1·27	3·42	1·35	2·73	8·85	1·69	0·28	0·08
Southwark Park	31	Tr.	1·36	4·96	3·57	5·23	15·12	3·57	0·70	0·08
Victoria Park ...	16	0·05	1·27	2·99	1·51	3·45	9·28	1·46	0·22	0·08
Wandsworth Com.	17	Nil.	Nil.	0·03	0·85	1·28	2·16	0·78	0 26	0·02
Golden Lane ...	23	0·15	2·26	2·68	1·71	2·79	9·59	1·22	0·84	0 84
Malvern	28	Tr.	0·07	0·28	0·33	0·99	1·67	0·43	0·10	0·01
Manchester—										
Queen's Park ...	52	—	—	—	—	—	5·70	—	—	—
School of Technology	42	—	—	—	—	—	10·60	—	—	—
Newcastle-on-Tyne	28	0·03	2·80	4·25	1·45	2·67	11·19	1·07	0·63	0·12
Rochdale	—	—	—	—	—	—	33·95	—	—	—
St. Helens	80	0·60	6·74	8·53	2·39	6·85	25·11	3·28	1·51	0·24
SCOTLAND.										
Coatbridge	68	0·10	2·14	6·31	2·88	6·31	17·74	2·76	0·38	0·26
Glasgow—										
Alexandra Park...	79	0·38	1·77	4·26	1·27	3·88	11·56	2·42	0·52	0·18
Bellahouston Park	105	0·17	1·39	4·18	2·22	4·90	12·86	3·47	1·00	0 07
Blythswood-sq. ...	116	0 40	2·09	3·59	1·25	7·49	14·82	3·83	0·74	0·25
Botanic Gardens	117	0·27	0·74	6·92	1·20	6·04	15 17	5·24	0·89	0·17
Richmond Park ...	167	0·26	1·70	5·00	2·16	4·16	13·28	2·92	0·36	0·22
Ruchill Park ...	119	0 38	1·25	3·33	2·25	4·91	12·12	3·42	0·75	0 17
South Side Park.	119	0·33	1·16	4·35	1·95	5·18	12·97	3·42	0 66	0·16
Tollcross Park ...	102	0·37	1·56	5·55	2·27	4·10	13·85	3·33	0·60	0 18
Victoria Park ...	114	0·48	1·87	5·13	2·07	7·56	17·11	4·07	0 73	0 19

March 31st, 1918.

Place.	Rainfall in millimetres.	Metric tons of deposit per square kilometre. Insoluble matter. Tar.	Carbonaceous other than tar	Ash.	Soluble matter. Loss on ignition.	Ash.	Total solids.	Included in soluble matter. Sulphate as (SO_3).	Chlorine (Cl).	Ammonia (NH_3).
ENGLAND.										
Leicester...	10	0·04	1·08	1·75	0·85	1·52	5·24	0·83	0 22	0·06
London—										
Meteorological Office...	24	0·13	2·20	3·43	1·24	3·56	10·56	1·03	0·54	0·03
Embankment Gardens	26	0·24	3·61	8·53	0·14	9·36	21·89	2·77	1·23	0 20
Finsbury Park ...	10	0·04	0 20	1·07	1·13	2·58	5·01	1 62	0·27	0·04
Ravenscourt Park	4	0·01	0·18	0·32	0·44	0·77	1·72	0·15	0·13	0 06
Southwark Park...	9	0·06	0 68	2·22	1·43	2·39	6·77	1·33	0·45	0·06
Victoria Park* ...	—	—	—	—	—	—	—	—	—	—
Wandsworth Com.	22	0·07	1·96	8·86	0·79	2·40	14·08	1·18	0·33	0·06
Golden Lane ...	27	0·11	2·58	3·31	1·39	3 20	10·60	1·32	0·97	0·16
Malvern	33	f.t.	0·07	0·25	0·28	0·93	1·54	0·41	0·07	0·01
Manchester—										
Queen's Park ...	49	—	—	—	—	—	5·01	—	—	—
School of Technology	40	—	—	—	—	—	12·50	—	—	—
Newcastle-on-Tyne	26	0·31	3·70	7·43	1·77	2·91	16·11	1·46	0·50	0·10
Rochdale	—	—	—	—	—	—	33·95	—	—	—
St. Helens	48	0·27	3·19	5·76	2·52	7·57	19·31	3·71	1·49	0·38
SCOTLAND.										
Coatbridge	32	0·09	1·68	3·95	2·37	5 60	13·69	2·72	0·18	0·19
Glasgow—										
Alexandra Park†	—	—	—	—	—	—	—	—	—	—
Bellahouston Park	37	0·25	1·73	2·98	2·34	2 63	9·94	1·82	0·20	0·06
Blythswood-sq. ...	36	0·12	1·89	3·63	1·53	4·07	11·24	2·08	0·27	0·10
Botanic Gardens	40	0·13	1·40	6·35	2·12	3·34	13 34	2·01	0·16	0·12
Richmond Park...	35	0 07	1·62	5·16	1·16	4·14	12·15	2·32	0·13	0·12
Ruchill Park ...	24	0 24	2·36	8·58	4·17	5·69	21·04	2·28	0·10	0·04
South Side Park..	33	0·13	3·80	6·25	2·76	2·59	15·53	1 95	0·14	0·08
Tollcross Park ...	29	0·28	1·56	3·42	2·26	2·65	10·17	1·76	0·15	0·07
Victoria Park ...	37	0·16	1·26	5·19	2 07	3 10	11·88	2·19	0·19	0·10

Tr. = trace. * No returns. † Sample lost.

"Tar" includes all matter insoluble in water but soluble in CS_2. "Carbonaceous" includes all combustible matter insoluble in water and in CS_2. "Insoluble ash" includes all earthy matter, fuel, ash, &c. One metric ton per sq. kilometre is equivalent to: (*a*) Approx. 9lb. per acre; (*b*) 2·56 English tons per sq. mile; (*c*) 1 g. per sq. metre; (*d*) 1/1000 mm. of rainfall.

The personnel of public health authorities concerned in the supervision of these examinations and of the analytical work involved remains the same as published in previous tables. The analyses of the rain and deposit caught in the gauge at the Meteorological Office are made in THE LANCET Laboratory.

THE ROYAL INSTITUTE OF PUBLIC HEALTH.—A further course of lectures and discussions on "Public Health Problems under War and After-war Conditions" is being held in the lecture-hall of this Institute (37, Russell-square, London, W.C.1) on successive Wednesdays in January, February, and March at 4 P.M. The subjects include industrial hygiene, the influenza epidemic, clean milk, women and the Ministry of Health, the tuberculosis problem, and after-war reconstruction, and among the lecturers are Dr. T. Carnwath, Captain, R.A.M.C. (T.F.), Professor I. Walker Hall, Professor E. W. Hope, Dr. W. J. O'Donovan, Mr. P. C. Varrier-Jones, Sir A. Newsholme, Sir Thomas Oliver, and Viscountess Rhondda. The next lecture, on Coal and National Health, will be given by Professor W. A. Bone on Jan. 15th, and the others will be duly announced in the Medical Diary from week to week.—An exhibit of organic arsenical preparations used in the treatment of venereal disease, as well as a striking collection of propaganda pamphlets and posters dealing with the anti-venereal campaign, is on view at the Institute. The latter has been presented to the Institute by Colonel Snow, of the Surgeon-General's Office, U.S. Army.

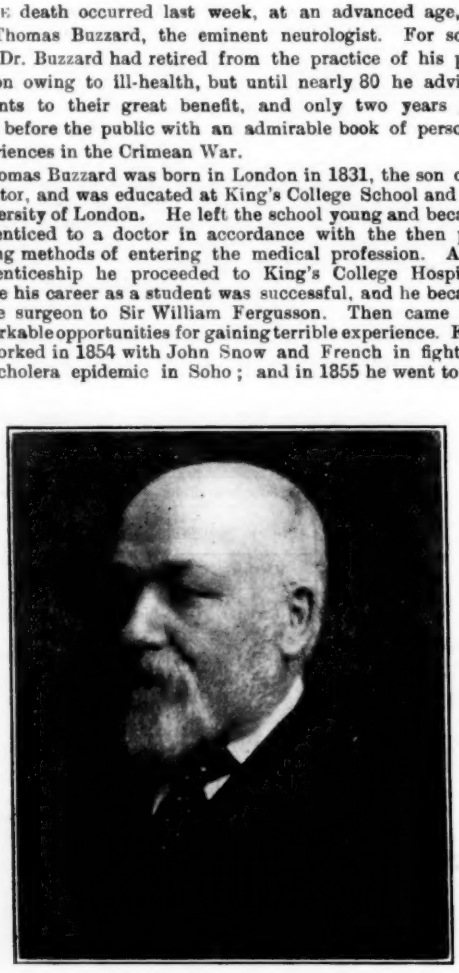
Obituary.

THOMAS BUZZARD, M.D. LOND., F.R.C.P. LOND.,

CONSULTING PHYSICIAN TO THE NATIONAL HOSPITAL FOR PARALYSIS AND EPILEPSY.

THE death occurred last week, at an advanced age, of Dr. Thomas Buzzard, the eminent neurologist. For some time Dr. Buzzard had retired from the practice of his profession owing to ill-health, but until nearly 80 he advised patients to their great benefit, and only two years ago came before the public with an admirable book of personal experiences in the Crimean War.

Thomas Buzzard was born in London in 1831, the son of a solicitor, and was educated at King's College School and the University of London. He left the school young and became apprenticed to a doctor in accordance with the then prevailing methods of entering the medical profession. After apprenticeship he proceeded to King's College Hospital, where his career as a student was successful, and he became house surgeon to Sir William Fergusson. Then came two remarkable opportunities for gaining terrible experience. First he worked in 1854 with John Snow and French in fighting the cholera epidemic in Soho; and in 1855 he went to the



THOMAS BUZZARD, M.D. LOND.

Crimean War, being appointed to the British medical staff of the Ottoman Army, attached to the headquarters of H.H. Omer Pasha. He was present at the siege of Sebastopol, at the second expedition to Kertch, and at the battle of Tchernaia, and after the fall of Sebastopol he accompanied the second Turkish Army to the Caucasus and took part in the establishment and conduct of base hospitals at Trebizonde and Sinope. For these services he received the Crimean medal with clasp for Sebastopol, the Order of the Medjidie and the Turkish War medal. The story is graphically and modestly set out in his book "With the Turkish Army in the Crimea and Asia Minor: a Personal Narrative," which was published by John Murray in 1916, with illustrations by the author.

On his return from the Crimea he resumed his studies and with such success that he became university medical scholar and later gold medallist in surgery. He graduated M.B. in 1857, and though his displayed and personal bent at the time was strongly towards surgical work he went into general practice as doctor to the St. Luke's district of St. James's parish. Here he remained for some six years, adding to an already great experience considering his age, that first-hand knowledge of life, men, and manners which made him a practical psychologist as well as a learned clinician. At this time he developed a gift which proved very valuable to him in his after-career. He employed his intimate acquaintance with certain sides of large affairs, as well as of the working life of the lower strata of society, in journalism, turning to writing for the press as a congenial task and an obvious method of adding to resources until private patients came. In 1863 he cut loose from his official work as a parish doctor and started in consultant practice in Green-street, Park-lane. For some time he was regularly on the staff of the *Daily News*, for which paper he had acted as correspondent during the Crimean War, and he also joined the staff of THE LANCET. A feature of this paper at the time was a department entitled the "Mirror of Hospital Practice," the articles which appeared under this title being notes written on the spot by a representative of the paper who was present at the various operating theatres of London. At this time operations were infrequent and were performed at the various hospitals only on certain days of the week and on certain hours of those days. Buzzard's work as a contributor to the "Mirror of Hospital Practice"—this, it may be said, is his own statement—first brought him into touch with the National Hospital at Queen-square, and provoked his interest in neurology and started also his lifelong and intimate friendship with Hughlings Jackson. He was shortly elected to the staff of the hospital, and here, while his main interest in neurology was essentially clinical, he never neglected the pathological side and, indeed, was one of the first to recognise the relationship of bacteriology to neurological problems. Perhaps his chief contributions to our medical knowledge had reference to the discrimination between organic and functional disorders especially in reference to disseminated sclerosis. This line of work was prompted by frequent consultation upon his gynæcological patients with William Playfair, to whom a great many women had recourse who, rightly or wrongly, were supposed to be the subjects of hysteria. Buzzard's book, entitled the "Simulation of Hysteria by Organic Disease," was the outcome of the investigation of such cases, and it was along these lines of medicine that he deservedly made his European reputation. Although he was only attached to one hospital, and that a neurological institution, his knowledge of general medicine saved him from taking narrow or loose views of his patients. He was able to devote a large part of his time to bedside study because he served one hospital only, while he made the most of the wonderful opportunities afforded him at Queen-square. So far was he from being merely a specialist that, in a way, the range of his interests and their large clinical nature probably obscured his scientific position, and to no other reason can we attribute the fact that a man, much of whose work was so original as well as so fruitful of work in others, should never have been invited to become a Fellow of the Royal Society. He was at different times President of the Clinical, Harveian, and Neurological Society, and Foreign Corresponding Member of the Société de Neurologie de Paris.

Although Buzzard wrote with ease and distinction he was not a voluminous author. He contributed the articles on hysteria, sciatica, and tic to "Quain's Dictionary of Medicine," and wrote in the journal of the Ophthalmological Society, to these columns, and to the columns of the *British Medical Journal* upon various neurological subjects. His record of his Crimean experiences, to which we have alluded, shows that had the idea appealed to him he could have easily gained a large public as a writer. He was a good public speaker and had also considerable artistic gifts, was an accomplished painter in water colours, etched with some success, and exhibited on several occasions. He was devoted to travel, and in his later life made many sea voyages, garnering impressions and sketching.

Dr. Buzzard married in 1869 Isabel, daughter of the late Joseph Wass, by whom he had two daughters and four sons, one of whom is Dr. E. Farquhar Buzzard. On the occasion of his marriage he removed from Green-street to 56, Grosvenor-street, where he remained over 20 years, finally moving to 74, Grosvenor-street, where he died. His domestic life was ideally happy, and the loss of his wife, who died in 1901, was a blow which he felt during the remainder of his days. He died very peacefully after a short and mild attack of influenza.

SIR WILLIAM BARTLETT DALBY, M.A. CANTAB., F.R.C.S ENG.,

CONSULTING AURAL SURGEON, ST. GEORGE'S HOSPITAL.

WE announced last week the death, at an advanced age, of Sir William Bartlett Dalby, who was a well-known aural surgeon in London a generation ago, as well as a regular contributor to the literature of these subjects in the coöperative medical treatises of the day.

Sir William Dalby was born at Ashby-de-la-Zouche in 1840 and was educated as Sidney Sussex College, Cambridge, and the medical school of St. George's Hospital. He graduated in Arts at Cambridge in 1863, proceeding to the M.B. degree in 1866, and for a time went into general practice at Chester. He soon, however, returned to London, became a Fellow of the Royal College of Surgeons of England in 1870, and decided to specialise in diseases of the ear. He was fortunate in becoming assistant to that singular and famous man James Hinton, who was then practising as an aural surgeon in Savile-row. Hinton died in 1874, but during his last illness Dalby took entire charge of his practice, and on the death of his chief acquired the house and connexion from Hinton's executors. Such a sale of consultant practices was in those days not unusual, though soon afterwards the proceeding was regarded askance, and, as a matter of fact, Hinton himself had purchased the practice and premises in Savile-row from the eminent aural surgeon Toynbee. With such an apprenticeship and such a start Dalby's success was assured, but he soon made a real and original departure, with which his name is not now associated as closely as it should be, for at the time he was a pioneer No doubt he acquired much both of his theories and his information from Germany, but to Dalby's credit it should be remembered that his advocacy of the instruction of the born-deaf child by lip-reading has transformed a large number of persons inflicted with a grave disability into perfectly capable, competent, and happy citizens. It was for work in this connexion that Dalby received his knighthood in 1886.

During the 20 years between 1875 and 1895 Dalby had a very large practice, and his opinion was sought from all parts of the kingdom. He published a series of lectures on diseases and injuries of the ear, and wrote articles on the same subject in Holmes's "System of Surgery" and Quain's "Dictionary of Medicine," while his "Short Contributions to Aural Surgery" ran through three editions, and deserved its popularity by its wide practical information and its pleasant writing. Dalby was not in any sense a good operating surgeon, and though he may have neglected steps to keep abreast with the surgical operative procedure of his day, it must be remembered that cranial surgery, when he was at the head of his specialty, was in its infancy. As aural surgeon to St. George's Hospital his out-patient clinics were well attended by the students who learned such science and technique as were then generally accepted, and who were often profoundly amused by Dalby's shrewd, humorous, caustic, but kindly attitude towards his patients. Many of the leaders of medicine and surgery of Dalby's day found themselves in an unstable position by the enormous development in operative surgery following on the discovery of Listerian doctrines and the perfection of methods of administering anæsthesia; and undoubtedly Dalby was embarrassed as a man of science by the date of his active work. But he was the main link between the periods of non-operative and operative aural surgery, and the developments in aural surgery following upon the work notably, among others, of Sir William Macewen and Sir Charles Ballance, he wisely determined not to attempt to follow practically. He never performed any complete mastoid operation, leaving such procedures to a younger generation.

Dalby was essentially a man of the world. His elaborately groomed appearance was more that of a leisured country gentleman than that of a leader in a highly technical surgical specialism. His wise if cynical attitude towards life was well displayed in the "Letters of Dr. Chesterfield," which he contributed towards the end of his professional career to the *Cornhill Magazine*, and from a worldly point of view most of what he said wittily in those letters cannot be controverted. He had a host of friends, was a member of the Athenæum, Carlton, and Garrick Clubs, was especially popular among artistic and literary people, was a well-read Shakespearian scholar, and a keen and constant attendant at the theatres. He rode, shot, fished, and yachted at various periods of his life, out of which he derived far more amusement than most medical men contrive to obtain.

Sir William Dalby married Hyacinthe, the daughter of Major Edward Wellesly, by whom he had two sons and three daughters. His elder son was drowned in a boating accident at Sandhurst; his second son, a soldier, survives him and was wounded in the present war. He leaves also a widow and three married daughters.

REGINALD PERCY COCKIN, M.D CANTAB.,

ASSISTANT MEDICAL ENTOMOLOGIST, LONDON SCHOOL OF TROPICAL MEDICINE, ETC.

WE regret to record the death of Dr. R. P. Cockin on Dec. 9th, 1918, at Kensington. Dr. Cockin was born at Hull in 1879 and studied at Cambridge, taking his M.A. degree in 1906 and his M.D. in 1913. His medical studies in London were carried out at the London Hospital. After graduating in medicine he acted as casualty house surgeon of Hull Royal Infirmary. Entering the West African Medical Service, he was appointed district surgeon of Okigwi in Southern Nigeria, and later on medical officer of the Niger Cross River Expedition in 1908–1909. In 1910 he was transferred to Cyprus, acting there as a district medical officer and examiner under the Pharmacy Act. In 1913 he was posted to Grenada, West Indies, where he was resident surgeon to the Colony and Yaws Hospitals, and also did bacteriological work. After this he joined the staff of the London School of Tropical Medicine. In 1915 he was appointed a temporary lieutenant in the Royal Army Medical Corps, and went to Egypt with Colonel R. T. Leiper and Captain J. G. Thomson, where he helped in the investigation of bilharziasis. Owing to ill health he had to resign his commission as captain, and resumed his duties at the London School of Tropical Medicine. When the special venereal clinics were formed in London by the Local Government Board, Dr. Cockin started the one at the Albert Dock Hospital, acting as its director.

Dr. Cockin's death in early middle age is a loss to the medical profession, for he was a man of wide experience and high scientific attainments.

URBAN VITAL STATISTICS.

(Week ended Jan. 4th, 1919.)

English and Welsh Towns.—In the 96 English and Welsh towns, with an aggregate civil population estimated at 16,500,000 persons, the annual rate of mortality, which had declined from 36·5 to 14·8 in the five preceding weeks, rose to 16·1 per 1000. In London, with a population slightly exceeding 4,000,000 persons, the death-rate was 16·6, or 2·8 per 1000 above that recorded in the previous week; among the remaining towns the rates ranged from 7·3 in Enfield, 8·8 in Oxford, and 9·0 in Ilford, to 23·2 in Gateshead, 25·4 in Sunderland, and 27·0 in Liverpool. The principal epidemic diseases caused 147 deaths, which corresponded to an annual rate of 0·5 per 1000, and included 51 from infantile diarrhœa, 49 from diphtheria, 17 from whooping-cough, 14 from measles, 11 from scarlet fever, and 5 from enteric fever. The deaths from influ nza, which had steadily declined from 7557 to 581 in the eight preceding weeks, further fell to 441, and included 66 in Liverpool, 65 in London, 19 each in Bristol and Birmingham, and 14 each in Manchester and Leeds. There were 3 cases of small-pox, 1062 of scarlet fever, and 1116 of diphtheria under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital; the two latter were 39 below and 11 above the respective numbers remaining at the end of the previous week. The causes of 61 deaths in the 96 towns were uncertified, of which 12 were registered in Liverpool, 8 in Birmingham, 6 in Manchester, and 3 each in Nottingham, Blackpool, South Shields, and Gateshead.

Scotch Towns.—In the 16 largest Scotch towns, with an aggregate population estimated at 2,500,000 persons, the annual rate of mortality was 16·7, against 14·8 and 16·1 per 1000 in the two preceding weeks. The 324 deaths in Glasgow corresponded to an annual rate of 15·1 per 1000, and included 6 from whooping-cough, 3 each from diphtheria and infantile diarrhœa, and 1 from measles. The 115 deaths in Edinburgh were equal to a rate of 17·8 per 1000, and included 3 from whooping-cough, 2 from diphtheria, and 1 from scarlet fever.

Irish Towns.—The 182 deaths in Dublin corresponded to an annual rate of 23·4, or 3·0 per 1000 above that recorded in the previous week, and included 2 from whooping cough and 1 from infantile diarrhœa. The 133 deaths in Belfast were equal to a rate of 17·3 per 1000, and included 2 from infantile diarrhœa and 1 from measles.

PRIZES of the Paris Académie des Sciences have been awarded as follows: Prix Montyon (physiology) to M. Stephen Chauvet, for a work on Pituitary Infantilism; Prix Lallemand to MM. Henry Cardot and Henry Langier, for work on the electrical stimulation of nerves; Prix L. Las Caze to Professor Raphaël Dubois, of Lyon, for contributions to physiology.

The War and After.

MEDICAL DEMOBILISATION.

Sir John Goodwin, the Director-General, Army Medical Service, states that owing to the very urgent requests of the National Service Ministry, the Civil Hospitals, and the Insurance Commissioners, it has been found necessary to demobilise immediately a large number of R.A.M.C. officers to meet the pressing needs of the civil population. The Director-General greatly regrets that, owing to the shortness of the notice, he has not found it possible to see or write personally to all officers on demobilisation, but he would like to assure them of his sincere gratitude for their valuable services and of his warm recognition of the very heavy personal sacrifices made by many of them in their desire to serve their country and to render assistance to the sick and wounded of the Army.

THE SCHEME OF THE CENTRAL MEDICAL WAR COMMITTEE FOR DEMOBILISATION.

A meeting of the Central Medical War Committee was held on Jan. 8th, at which the scheme for demobilisation of medical men was discussed. A circular letter having been sent by the National Insurance Commissioners to the Insurance Committees in England and in Wales, as well as to individual doctors, Sir Robert Morant addressed the meeting to point out that he disclaimed any desire to act in opposition to the Central Medical War Committee. His department, however, he said, must consider first the needs of the civilian population, and he added that, of the 12,000 medical men on the panel before the war, at least one-third were absent, either with the colours or owing to the inevitable wastage of four and a half years; figures which meant that the pre-war standard of medical practice could not be maintained.

The Ministry of National Service having sent out a questionnaire to be completed by medical officers holding commissions in any of the Services, Sir James Galloway explained to the Central Medical War Committee the present position. He indicated that the figure of 1400 had been mentioned as representing the number of practitioners whose return from the Services was urgently required, and that this number was now within sight. The War Office, he said, had found less difficulty than had been anticipated in releasing men, large military hospitals were to be immediately demobilised, and no less than 13,000 V.A.D. beds had already been dismantled.

General Principles of the Scheme.

The scheme for priority of release drawn up by the Central Medical War Committee is intended to apply to the demobilisation on personal and professional grounds of all medical officers serving temporarily with the Forces. It has received the approval of the Ministry of National Service; but as it has not yet been adopted by the Scottish Medical Emergency Committee, it applies at present to practitioners from England and Wales only. The following notes will serve to indicate the principles upon which the scheme is based.

The main object has been to devise a plan which is at once simple, capable of amendment at any time, and easily explained to those concerned. As soon as provision is made for areas in which the medical service has been dangerously depleted it is proposed that the demobilisation of medical officers shall proceed along lines which take into account (*a*) length of service; (*b*) age; (*c*) special personal hardships in connexion with their practices; and (*d*) family responsibilities. For this purpose the names of those over the age of 30 on Nov. 11th, 1918, will be classified in the following groups: (1) Those who were mobilised at the outbreak of war; (2) those who have served over three years; (3) those who have served between two and three years; (4) those who have served between one and two years; (5) those who have served less than one year. Each group will be divided into four subgroups arranged according to age.

The data for this primary grouping are readily obtainable, definite in character, and easily tabulated; but other factors, less easily tabulated, affecting some officers, must also be taken into account. Information which will be at the disposal of the Central Medical War Committee will enable it to take these special factors into consideration, and then, if necessary, to shift the position of an officer into a different group from that in which the primary classification has placed him. In this process the following points will be taken into account: (1) Whether he is married or single, and the size of his family, if any; (2) if all the members of a partnership are away, or if the practice is single-handed; (3) his paid appointments (panel or otherwise), if any; whether such appointments are whole-time; and whether they have been kept open for him.

Special claims on financial or other grounds, which are not taken into account in the above method of classification, may be submitted to the Committee for special assessment.

The scheme is as follows:—

PART I.—*Men over 30 Years of Age at Date of Armistice—i.e., Men Born on or before Nov. 11th, 1888.*

(i.) The following points will be awarded on the grounds of length of service and age:—

Men mobilised at the outbreak of war (R.N.V.R., R.N.R., R.A.M.C.(T.), & R.A.M.C.(S.R.)):

	Points.
Over 45	30
40–45	29
35–40	28
30–35	27

Men with over 3 years' service:

	Points.
Over 45	26
40–45	25
35–40	24
30–35	23

Men with over 2 years' service:

	Points.
Over 45	22
40–45	21
35–40	20
30–35	19

Men with 1 year's service:

	Points.
Over 45	18
40–45	17
35–40	16
30–35	15

Men with less than 1 year's service:

	Points.
Over 45	14
40–45	13
35–40	12
30–35	11

(ii.) The following points will be added or subtracted in respect of the following modifying conditions:—

(1)	If in whole-time salaried post, subtract	6 points.
(2)	If with no paid appointment or N.H.I. work, add	3 ,,
(3)	If in single-handed practice, add	3 ,,
(4)	If all members of partnership are on service, and no member of the partnership is otherwise entitled to more than points, add, in case of one partner	4 ,,
(5)	If married, add	4 ,,
(6)	If dependents, children or otherwise, 1 point for each dependent up to a maximum of	4 ,,

(iii.) Additional points may be awarded in respect of financial or other circumstances of an exceptional character which justify a claim to a higher order of priority than that determined by the foregoing provisions. The award of any such additional points would be the subject of special assessment by the Committee, and any man who deems that he has suffered special hardship on such grounds should apply to the Committee for a special consideration of his case on the facts.

(iv.) The order of priority of men of 30 and over shall be according to the net number of points accruing to each man under this part of the scheme, men with a greater number of points ranking before men with a less number of points.

PART II.—*Men under 30 Years of Age at Date of Armistice—i.e, Men Born after Nov. 11th, 1888.*

(v.) The order of priority determined under Part II. shall be in continuation of the order of priority determined under Part I.

(vi.) The order of priority of men under 30 years at the date of the armistice shall be according to their age, the older before the younger, no priority being, however, accorded as between men born in any one calendar year:

Provided that, in the event of the Central Medical War Committee deciding, upon a special application, that financial or other circumstances exist of an exceptional character which justify a claim by the applicant to a higher order of priority than that accorded under the foregoing provisions, the Committee may award that the applicant should be classed either on a level of priority (under Part II.) with men born in a specified earlier calendar year, or on a level of priority with men entitled to a specified number of points (under Part I.).

THE CASUALTY LIST.

The names of the following medical officers appear among the casualties announced since our last issue:—

Died.

Capt. J. S. Martin, R.A.M.C., was educated at Edinburgh and at St. Thomas's Hospital, London, and qualified in 1895. He held appointments at the Rotherham Hospital and at the Royal Infirmary, Edinburgh, and prior to joining up was in practice at Leigh, Lancs., where he was honorary surgeon to the local infirmary.

Surg. J. M. Pickthall, R.N., qualified in Edinburgh in 1885. He practised in Cornwall and in the Channel Islands, and was latterly surgeon on the Hospital Ship *Oxfordshire*, and the cable ship *Britannia*.

Capt. F. I. Mackinnon, R.A.M.C., qualified at Edinburgh in 1883, and was in Damascus when he joined up for war service. He died at Alexandria from pneumonia.
Capt. W. F. Luton, Canadian A.M.C.

Wounded.

Lieut. A. J. Abreu, I.M.S.
Capt. G. A. Khan, I.M.S. ——

THE HONOURS LIST.

The following awards to and promotions of medical officers for services at home in connexion with the war or for valuable services in the indicated spheres of operations are announced :—

Services at Home.

K.C.B.—Maj.-Gen. G. J. H. Evatt, C.B.; Lt.-Gen. T. H. J. C. Goodwin, C.B., C.M.G., D.S.O., K.H.S., A.M.S.
K.C.M.G.—Maj.-Gen. W. W. Pike, C.M.G., D.S.O., A.M.S.; Temp. Col. J. Atkins, C.M.G., A.M.S.
C.M.G.—Col. H. A. Chisholm, Canadian A.M.C.; Temp. Col. (Hon. Surg.-Gen.) C. S. Ryan, Australian A.M.C.; Lt.-Col. F. Marshall, Australian A.M.C.; Col. E. J. O'Neill, D.S.O., N.Z.M.C.
K.C.B.E.—Temp. Hon. Col. J. L. Thomas, C.B., C.M.G.; Col. H. E. B. Bruce-Porter, C.M.G., A.M.S. (T.F.).
C.B.E.—Lt.-Col. C. W. Cathcart, R.A.M.C.(T.F.); Col. T. H. M. Clarke, C.M.G., D.S.O., A.M.S; Col. G. Dansey-Browning, A.M.S.; Lt.-Col. Sir J. Fayrer, Bart., R.A.M.C.(T.F.); Col. R. Jennings, K.H.S., late A.M.S.; Maj. H. J. Neilson, late R.A.M.C.; Temp. Hon. Maj. H. S. Souttar, R.A.M.C.
O.B.E.—Col. W. H. Bull, V.D., A.M.S. (T.F. Res.); Maj. J. J. Cox, R.A.M.C.(T.F. Res.); Capt. R. Johnson, R.A.M.C. (T.F.); Lt.-Col. J. R. Mallins, late R.A.M.C.; Dr. Adeline Roberts, Q.M.A.A.C., Recruiting Medical Controller; Bt. Col. C. J. W. Tatham, ret. pay, late R.A.M.C.; Capt. J. S. White, R.A.M.C. (S.R.).
M.B.E.—Temp. Capt. J. N. Martin, R.A.M.C.
C.B.E.—Col. G. D. Farmer, Canadian A.M.C.; Col. J. Stewart, Canadian A.M.C.
O.B.E.—Capt. (acting Maj.) J. R. Goodall, Canadian A.M.C.; Lt.-Col. R. Raikes, Canadian A.M.C.; Lt.-Col. A. A. Smith, Canadian Army Dental Corps; Maj. (acting Lt.-Col.) A. W. Winnett, Canadian Army Dental Corps.
C.B.E.—Lt.-Col. (temp. Col.) M. McWhae, C.M.G., Aust. A.M.C.; Col. H. C. Maudsley, C.M.G., Aust. A.M.C.
O.B.E.—Maj. F. T. Beamish, Aust. A.M.C.; Maj. J. E. Down, Aust. Army Dental Corps; Lt.-Col. B. M. Sutherland, Aust. A.M.C.; Maj. G. C. Willcocks, M.C., Aust. A.M.C.; Lt.-Col. C. Yeatman, Aust. A.M.C.
C.B.E.—Maj. (temp. Lt.-Col.) W. M. Macdonald, N.Z.M.C.; Lt.-Col. H. J. McLean, N.Z.M.C.
O.B.E.—Maj. A. S. Brewis, N.Z.M.C.; Maj. W. Bruce, N.Z.M.C.
C.B.E.—Temp. Lt.-Col. E. N. Thornton, O.B.E., S.A.M.C.
O.B.E.—Temp. Maj. M. G. Pearson, S.A.M.C.
To be Brevet Colonel.—Lt.-Col. P. S. O'Reilly, C.M.G., R.A.M.C.; Lt.-Col. Sir J. G. Rogers, K.C.M.G., D.S.O., ret. pay (late A.M.S.).
To be Honorary Colonel.—Lt.-Col. W. H. W. Elliot, D.S.O., ret., I.M.S.
To be Brevet Lieutenant-Colonel.—Temp. Maj. F. S. Brereton, ret. (late R.A.M.C.); Temp. Maj. G. P. Humphery, R.A.M.C.
To be Brevet Major.—Temp. Capt. R. Bruce-Low, R.A.M.C.; Capt. (acting Maj.) A. A. Jubb, R.A.M.C. (T.F.); Capt. (acting Maj.) A. T. J. McCreery, M.C., R.A.M.C.; Temp. Capt. W. J. Tulloch, R.A.M.C.

Operations in Egypt.

C.B.—Temp. Lt.-Col. H. L. Eason, C.M.G., R.A.M.C.
C.M.G.—Lt.-Col. (temp. Col.) E. P. Sewell, D.S.O., R.A.M.C.
C.B.E.—Temp. Col. C. C. Choyce, R.A.M.C.; Lt.-Col. (temp. Col.) C. Garner, late R.A.M.C.
O.B.E.—Capt. R. Brierciffe, R.A.M.C.(T.F.); Temp. Capt. F. H. Diggle, R.A.M.C.; Maj. W. Dyson, R.A.M.C. (T.F.); Maj. (acting Lt.-Col.) W. F. Ellis, R.A.M.C.; Temp. Capt. W. W. Forbes, R.A.M.C.; Temp. Capt. N. S. Gilchrist, R.A.M.C.; Maj. F. Gracie, R.A.M.C. (T.F.); Capt. D. L. Graham, I.M.S.; Capt. J. Inglis, R.A.M.C. (T.F.); Capt. T. F. Kennedy, R.A.M.C.; Maj. (acting Lt.-Col.) J. W. Mackenzie, R.A.M.C. (T.F.); Capt. (acting Maj.) L. M. V. Mitchell, R.A.M.C. (T.F.); Temp. Capt. C. W. Smith, R.A.M.C.; Lt.-Col. G. E. F. Stammers, R.A.M.C.; Maj. G. C. Taylor, R.A.M.C. (T.F.); Maj. F. B. Treves, R.A.M.C. (T.F.); Capt. (temp. Lt.-Col.) P. S. Vickerman, R.A.M.C. (S.R.); Capt. (acting Maj.) A. P. Watson, R.A.M.C. (T.F.); Temp. Lt. K. R. Madan, I.M.S.
M.B.E.—Capt. J. Green, R.A.M.C. (T.F.).
C.B.E.—Lieut.-Col. (temp. Col.) G. P. Dixon, Aust. A.M.C.
O.B.E.—Lt.-Col. C. B. Backburn, Aust. A.M.C.; Maj. N. H. Fairley, Aust. A.M.C.; Lt.-Col. (temp. Col.) R. Fowler, Aust. A.M.C.; Lt.-Col. (temp. Col.) J. C. Storey, Aust. A.M.C.
M.B.E.—El Yuzbashi Halim Effendi Sulman Shoucair, Egyptian Army M.C.
To be Brevet Colonel.—Lt.-Col. E. E. Powell, D.S.O., R.A.M.C.
To be Brevet Lieutenant-Colonel.—Maj. (acting Lt.-Col.) A. W. Gibson, R.A.M.C.
To be Brevet Major.—Temp. Capt. P. H. Bahr, D.S.O.; R.A.M.C.
Distinguished Service Order.—Maj. E. E. Austen, attd. R.A.M.C.; Maj. L. A. Avery, R.A.M.C. (T.F.); Maj. (acting Lt.-Col.) J. Evans, R.A.M.C. (T.F.).
Military Cross.—Capt. (acting Maj.) J. H. Beverland, R.A.M.C. (S.R.); Temp. Capt. G. J. C. Ferrier, R.A.M.C.; Capt. (temp. Maj.) I. P. Harris, R.A.M.C. (T.F.); Capt. W. F. T. Haultain, R.A.M.C. (S.R.); Temp. Lt. B. H. Kamakaka, I.M.S.; Capt. (acting Maj.) L. Milton, R.A.M.C.; Temp. Capt. H. J. Rae, R.A.M.C.; Temp. Capt. F. C. Robbs, R.A.M.C.; Capt. (acting Maj.) A. B. P. Smith, R.A.M.C.; Capt. C. Anderson, Aust. A.M.C.

Operations in Italy.

C.M.G.—Lt.-Col. (temp. Col.) S. A. Archer, R.A.M.C.; Lt.-Col. (acting Col.) H. A. L. Howell, R.A.M.C.; Lt.-Col. J. W. West, R.A.M.C.; Lt.-Col. C. H. Purnivall, R.A.M.C.
O.B.E.—Capt. (acting Maj.) T. D. Inch, M.C., R.A.M.C.; Capt. A. Picken, R.A.M.C. (S.R.); Capt. (acting Maj.) J. D. Wells, R.A.M.C. (T.F.)
To be Brevet Colonel.—Lt.-Col. H. Chopping, C.M.G., R.A.M.C.
To be Brevet Lieutenant-Colonel.—Maj. (temp. Lt.-Col.) J. G. Bell, D.S.O., R.A.M.C.
To be Brevet Major.—Capt. (acting Col.) W. G. Wright, D.S.O., R.A.M.C.
Distinguished Service Order.—Capt. (acting Lt.-Col.) R. A. Broderick, M.C. R.A.M.C. (T.F.); Temp. Capt. W. Mackenzie, R.A.M.C.
Military Cross.—Temp. Capt. A. H. Macklin R.A.M.C.

Operations in Salonika.

C.B.—Temp. Col. A. G. Phear; Capt. and Bt. Maj. (temp. Col.) R. E. Kelly, R.A.M.C. (T.F.).
C.M.G.—Lt.-Col. C. B. Martin, R.A.M.C.
O.B.E.—Temp. Capt. (acting Maj.) D. I. Anderson, R.A.M.C.; Temp. Capt. J. C. M. Bailey, R.A.M.C.; Temp. Capt. (acting Maj.) G. V. Bakewell, R.A.M.C.; Capt. (acting Maj.) T. Y. Barkley, R.A.M.C. (S.R.); Lt.-Col. M. Boyle, R.A.M.C.; Temp. Capt. A. H. Coleman, R.A.M.C.; Temp. Capt. J. A. Delmege, R.A.M.C.; Temp. Capt. R. R. Elworthy, R.A.M.C.; Capt. (acting Maj.) W. B. Foley, R.A.M.C. (S.R.); Maj. W. R. Galwey, M.C., R.A.M.C.; Maj. (temp. Lt.-Col.) J. Gray, R.A.M.C. (T.F.); Lt.-Col. J. E. Hodgson R.A.M.C.; Capt. H. E. McColl, R.A.M.C. (S.R.); Lt.-Col. P. Mitchell, R.A.M.C. (T.F.); Capt. (acting Maj.) J. Taylor, R.A.M.C. (T.F.); Lt.-Col. F. E. A. Webb, R.A.M.C. (T.F.).
M.B.E.—Lt. (temp. Capt., acting Maj.) R. A. Mansell, R.A.M.C.; Temp. Lt. J. Ramsbottom, R.A.M.C.
To be Brevet Lieutenant-Colonel.—Maj. (temp. Lt.-Col.) J. A. Anderson, R.A.M.C.
To be Brevet Major.—Capt. (temp. Maj.) R. E. Barnsley, M.C., R.A.M.C.; Capt. (acting Maj.) W. F. Christie, R.A.M.C.; Capt. (temp. Maj.) M. J. Williamson, M.C., R.A.M.C.
Military Cross.—Capt. R. D. Cameron, R.A.M.C. (S.R.); Capt. M. C. Cooper, R.A.M.C. (S.R.); Capt. G. B. Egerton, R.A.M.C. (S.R.); Temp. Capt. (acting Maj.) G. B. Holroyde, R.A.M.C.; Capt. L. J. Sheil, R.A.M.C. (S.R.); Capt. H. W. Torrance, R.A.M.C. (S.R.); Capt. L. H. Wootton, R.A.M.C. (T.F.).

The following is the continuation of the list the first part of which was given in THE LANCET of Jan. 4th, p. 41 :—

C.I.E.—Lt.-Col. J. T. Calvert, I.M.S.; Maj. J. H. Murray, I.M.S.; Lt.-Col. F. E. Swinton, I.M.S.; Lt.-Col. J. C. Lamont, I.M.S. (ret.).
C.B.E. (Military Division).—Surg. Capt. G. T. Broach R.N.; Surg. Capt. V. G. Thorpe, R.N.; Maj. (Hon. Lt.-Col.) M. W. Flack; Acting Lt.-Col. F. F. Muecke.
O.B.E. (Military Division).—Surg. Cdr. R. F. Bate, R.N.; Surg. Cdr. R. Hardie, R.N.; Surg. Lt. A. B. Iles, R.N.; Surg. Lt.-Cdr. L. M. Morris, R.N.; Surg. Cdr. (acting Surg. Capt.) H. L. Penny, R.N.; Surg. Cdr. E. A. Shaw, R.N.; Lt.-Col. E. O. B. Carbery; Maj. B. R. O'Reilly, Canadian Forces; Maj. F. H. Stephens, A.M.S.; Capt. (temp. Maj.) H. C. Adams, R.A.M.C. (T.F.); Lt.-Col. W. J. P. Adye Curran, R.A.M.C.; Temp. Capt. (acting Maj.) J. A. Arkle, R.A.M.C.; Lt.-Col. (temp. Col.) H. P. W. Barrow, C.M.G., D.S.O., R.A.M.C.; Capt. (acting Maj.) C. B. Baxter, R.A.M.C. (T.F.); Temp. Lt. (acting Lt.-Col.) J. L. Birley, R.A.M.C.; Maj. H. d'A. Blumberg, T.D., R.A.M.C. (T.F.); Capt. (acting Maj.) H. Burrows, R.A.M.C.(T.F.); Temp. Capt. (acting Maj.) R. Charles, R.A.M.C.; Capt. A. D. Child, R.A.M.C. (S.R.); Capt. (acting Maj.) S. J. Clegg, R.A.M.C. (T.F.); Temp. Capt. N. A. Coward, R.A.M.C.; Capt. (acting Maj.) W. H. Davison, R.A.M.C. (T.F.); Temp. Maj. W. S. Dickie, R.A.M.C.; Temp. Maj. T. M. Frood, R.A.M.C.; Temp. Maj. (acting Lt.-Col.) G. D. Gray, R.A.M.C.; Capt. (acting Lt.-Col.) F. L. A. Greaves, R.A.M.C. (T.F.); Temp. Capt. A. H. Greg, R.A.M.C.; Capt. (acting Maj.) T. W. Hancock, R.A.M.C. (T.F.); Temp. Capt. (acting Maj.) J. H. Hebb, R.A.M.C.; Temp. Hon. Maj. T. Houston, R.A.M.C.; Capt. A. E. Jury, R.A.M.C. (T.F.); Temp. Capt. R. D. Laurie, R.A.M.C.; Temp. Capt. L. R. Lempriere, R.A.M.C.; Maj. (temp. Lt.-Col.) F. A. McCammon, M.C., R.A.M.C.; Temp. Capt. J. W. McLeod, R.A.M.C.; Temp. Capt. (acting Maj.) W. G. Mumford, R.A.M.C.; Capt. J. C. Newman, R.A.M.C. (T.F.); Capt. B. A. Odlum, R.A.M.C.; Temp. Capt. E. I. P. Pellew, R.A.M.C.; Capt. J. Ramsay, R.A.M.C. (T.F.); Temp. Capt. (acting Maj.) T. C. Ritchie, R.A.M.C.; Lt.-Col. (temp. Col.) A. B. Soltau, C.M.G., R.A.M.C. (T.F.); Maj. (temp. Lt.-Col.) W. G. Sutcliffe, R.A.M.C. (T.F.); Maj. (acting Lt.-Col.) T. B. Unwin, R.A.M.C.; Capt. (acting Maj.) W. W. Wagstaffe, R.A.M.C. (S.R.); Temp. Capt. K. M. Walker, R.A.M.C.; Temp. Capt. (acting Maj.) H. B. Wilson, R.A.M.C.; Capt. (acting Lt.-Col.) T. B. Wolstenholme, R.A.M.C. (T.F.); Capt. (acting Lt.-Col.) F. Worthington, D.S.O., R.A.M.C.; Lt.-Col. P. G. Brown, Canadian A.M.C.; Maj. J. F. Burgess, Canadian A.M.C.; Maj. R. J. McKwan, Canadian A.M.C.; Lt.-Col. H. E. Munroe, Canadian A.M.C.; Maj. H. Orr, Canadian A.M.C.; Maj. D. M. Embelton, Australian A.M.C.; Maj. C. N. Finn, Australian A.M.C.; Maj. (temp. Lt.-Col.) A. F. Maclure, Australian A.M.C.; Lt.-Col. W. D. G. Upjohn, Australian A.M.C.
To be Major-General.—Col. (temp. Maj.-Gen.) J. Thomson, C.B., A.M.S.
To be Brevet Colonel.—Lt.-Col. (temp. Col.) R. S. H. Fuhr, C.M.G., D.S.O., R.A.M.C.; Lt.-Col. (temp. Col.) A. G. Thompson, C.M.G., D.S.O., R.A.M.C.
To be Brevet Lieutenant-Colonel.—Maj. (temp. Lt.-Col.) R. A. Bryden, D.S.O., R.A.M.C.; Maj. (temp. Lt.-Col.) P. J. Hanafin, D.S.O., R.A.M.C.; Maj. (temp. Lt.-Col.) H. S. Peeke, R. of O., late R.A.M.C.; Maj. (temp. Col.) D. Rorie, D.S.O., R.A.M.C. (T.F.); Maj. G. F. Sheehan, D.S.O., R.A.M.C.
To be Brevet Major.—Temp. Capt. S. P. Hodkinson, R.A.M.C.; Capt. (acting Maj.) W. L. Webster, R.A.M.C.
D.S.O.—Surg. Lt.-Cdr. H. D. Drennan, R.N.; Capt. (temp. Lt.-Col.) J. Barkley, R.A.M.C. (T.F.); Capt. (acting Lt.-Col.) R. Burgess, M.C., R.A.M.C. (T.F.); Maj. (acting Lt.-Col.) A. Callam, R.A.M.C. (T.F.); Capt. (acting Lt.-Col.) L. D. B. Cogan, R.A.M.C. (T.F.); Maj. (acting Lt.-Col.) E. H. Cox, R.A.M.C. (T.F.); Capt. (acting Lt.-Col.) F. G. Dobson, R.A.M.C. (T.F.); Capt. (acting Maj.) T. I. Dun, M.C., R.A.M.C.; Capt. (temp. Lt.-Col.) C. W. Eames, R.A.M.C. (T.F.); Maj. (acting Lt.-Col.) C. T. Edmunds, R.A.M.C.; Maj. (acting Lt.-Col.) W. H. Forsyth, R.A.M.C.; Capt. (acting Lt.-Col.) C. J. A. Griffin, R.A.M.C. (S.R.); Capt. (acting Lt.-Col.) C. Helm, M.C., R.A.M.C.; Temp. Capt. (acting Maj.) A. E. Knight, M.C., R.A.M.C.; Capt. (acting Lt.-Col.) C. Lt. Lander, M.C., R.A.M.C. (T.F.); Maj. (acting Lt.-Col.) S. G. McAllum, R.A.M.C. (S.R.); Lt.-Col. (temp. Col.) F. McLennan, R.A.M.C.; Capt. (acting Lt.-Col.) J. MacMillan, M.C., R.A.M.C.; Capt. (acting Lt.-Col.) C. M. Page, R.A.M.C. (S.R.); Temp. Capt. (acting Maj.) M. P. Paton, M.C., R.A.M.C.; Maj. (acting Lt.-Col.) T. T. H. Robinson, R.A.M.C.; Maj. (acting Lt.-Col.) J. H. Stephen, R.A.M.C. (T.F.); Temp. Capt.,

(acting Lt.-Col.) R. Svensson, M.C., R.A.M.C.; Capt. (acting Lt.-Col.) J. Young, R.A.M.C. (T.F.); Temp. Lt.-Col. C. W. Vipond, Canadian A.M.C.; Maj. (acting Lt.-Col.) J. H. Wood, Canadian A.M.C.; Lt.-Col. R. W. Chambers, Australian A.M.C.; Lt.-Col. W. E. L. H. Crowther, Australian A.M.C.; Maj. (temp. Lt.-Col.) E. F. Lind, Australian A.M.C.; Lt.-Col. G. W. Macartney, Australian A.M.C.; Maj. A. McKillop, Australian A.M.C.; Maj. C. Morlet, Australian A.M.C.; Maj. W. A. Morton, Australian A.M.C.; Maj. V. W. Savage, Australian A.M.C.; Maj. W. C. Sawers, Australian A.M.C.; Lt.-Col. G. Craig, N.Z.M.C.

Second Bar to the Military Cross.—Capt. H. K. Ward, M.C., R.A.M.C. (S.R.).

Bar to the Military Cross.—Temp. Capt. (acting Maj.) J. Biggam, M.C., R.A.M.C.; Capt. E. J. Bradley, M.C., R.A.M.C. (S.R.).

Military Cross.—Temp. Capt. R. J. Aherne, R.A.M.C.; Capt. (acting Maj.) W. R. Blore, R.A.M.C. (S.R.); Temp. Capt. A. Buchanan, R.A.M.C.; Capt. (acting Maj.) W. B. Cathcart, R.A.M.C. (S.R.); Capt. (acting Maj.) G. O. Chambers, R.A.M.C.; Temp. Capt. C. F. Drew, R.A.M.C.; Capt. E. McM. Dunlop, R.A.M.C. (T.F.); Temp. Capt. (acting Maj.) J. Gibson, R.A.M.C.; Capt. F. H. Gurney, R.A.M.C. (S.R.); Temp. Capt. (acting Maj.) E. L. M. Hackett, R.A.M.C.; Capt. G. L. Matthews, R.A.M.C.; Capt. (acting Maj.) C. Nicholson, R.A.M.C. (S.R.); Capt. (acting Maj.) A. P. O'Connor, R.A.M.C.; Temp. Capt. J. F. Powell, R.A.M.C.; Temp. Capt. C. R. Reckitt, R.A.M.C.; Capt. (acting Maj.) H. R. S. Richards, R.A.M.C. (T.F.); Capt. (acting Maj.) F. B. W. Rogers, R.A.M.C. (T.F.); Temp. Capt. S. P. Stoker, R.A.M.C.; Capt. (acting Lt.-Col.) D. H. Weir, R.A.M.C. (T.F.); Temp. Capt. (acting Maj.) B. Whitehead, R.A.M.C.; Temp. Capt. J. Wylie, R.A.M.C.; Capt. N. J. MacKay, Australian A.M.C.; Capt. N. H. Dempster, N.Z.M.C.; Capt. A. D. S. Whyte, N.Z.M.C.

Kaisar-i-Hind Medal, 1st Class.—Mr. J. D. Price, Civil Surgeon, Nowgong, Assam.

MENTIONED IN DESPATCHES.

In a lengthy and most interesting despatch dealing with the brilliant victories of the British Army on the Western front which led up to the signing of the armistice on Nov. 11th last, Sir Douglas Haig pays the following tribute to the medical services:—

During the period under review the medical services, under the direction of Lieut.-General C. H. Burtchaell, deserve special commendation for the initiative, energy, and success which have characterised all branches of their work. The rapid advance of the troops and the extended front on which operations were carried out during the final stages of the offensive created problems in connexion with the collection, evacuation, and treatment of wounded which had not been met with in the earlier phases of the war. These difficulties were met with the most admirable promptness and efficiency.

My thanks are due to the consulting surgeons and physicians for the invaluable assistance given by them in the application of new methods to the treatment of wounds and disease; to the R.A.M.C. officers and permanent staffs of the convalescent depôts for work which enabled many thousands of men to be restored to the fighting ranks; to the untiring and devoted work of the British Red Cross Society, the Order of St. John, and all members of the nursing service, whose unremitting kindness and constancy have done much to alleviate the sufferings of the sick and wounded; and, finally, for the very valuable services rendered by the base hospital units and by individual officers of the Medical Corps of the United States of America attached to the British Army.

The following medical officers of the Royal Air Force are mentioned in despatches for distinguished service in war areas:—

Surg. W. A. S. Duck, R.N. (Adriatic); Temp. Surg. A. L. Dykes, R.N. (Adriatic); Temp. Surg. R. S. Overton, R.N. (Mediterranean); Fleet Surg. C. E. C. Stanford, D.S.O., R.N. (Adriatic).

Also the following for distinguished and gallant services and devotion to duty in connexion with the operations of the British Force in Italy:—

Army Medical Service: Staff.

Lt.-Col. (temp. Col.) S. A. Archer; Lt.-Col. A. Chopping, C.M.G.; Capt. (acting Maj.) M. Coplans, D.S.O., R.A.M.C. (T.F.); Col. J. V. Forrest, C.M.G.; Capt. (acting Maj.) T. D. Inch, M.C.; Temp. Capt. (acting Maj.) B. H. Lucas, M.C.; Maj.-Gen. F. R. Newland, C.B., C.M.G.; Lt.-Col. (temp. Col.) R. Pickard, C.M.G., T.D., R.A.M.C. (T.F.); Temp. Col. H. H. Tooth, C.B., C.M.G. (Lt.-Col., R.A.M.C. (T.F.)); Capt. (temp. Maj.) S. J. A. H. Walshe, D.S.O., R.A.M.C. (S.R.); Temp. Col. C. G. Watson, C.M.G.; Capt. (acting Maj.) J. D. Wells, R.A.M.C. (T.F.); Col. T. Du B. Whaite, C.M.G.

Royal Army Medical Corps.

Temp. Capt. C. J. Armstrong-Dash; Maj. (temp. Lt.-Col.) J. G. Bell; D.S.O.; Maj. (acting Lt.-Col.) C. Bramhall; Temp. Capt. D. Fisher, Lt.-Col. C. H. Furnivall; Temp. Capt. H. R. T. Gamlen; Temp. Capt. D. G. Gardiner; Temp. Capt. (acting Maj.) J. Greene, M.C.; Temp. Capt. (acting Maj.) J. S. Hall; Lt.-Col. (acting Col.) H. A. L. Howell; Temp. Capt. W. Mackenzie; Temp. Capt. S. Marle; Temp. Capt. J. B. Matthews; Temp. Capt. (acting Maj.) A. A. Miller; Capt. (acting Maj.) J. A. Renshaw; Temp. Capt. (acting Maj.) R. H. Rollinson-Whitaker; Temp. Capt. H. S. Thomas; Capt. (acting Lt.-Col.) E. W. Vaughan, M.C.; Lt.-Col. J. W. West; Capt. (acting Col.) W. G. Wright, D.S.O.

Royal Army Medical Corps (S.R.).

Capt. J. E. Allan; Capt. (acting Maj.) T. O. Graham; Capt. A. Picken.

Royal Army Medical Corps (T.F.).

Capt. K. S. Beken; Capt. (acting Lt.-Col.) R. A. Broderick, M.C.; Capt. (acting Maj.) J. A. Davies; Capt. (acting Maj.) W. C. Hodges; Capt. G. Moore, M.C.; Capt. P. Moxey.

The following should be added to the list of those mentioned in despatches given in THE LANCET of Jan. 4th, page 41:—

Canadian Army Medical Staff.—Col. C. A. Peters, D.S.O.; Brig.-Gen. A. E. Ross, C.B., C.M.G.; Col. R. M. Simpson, D.S.O.; Col. R. P. Wright, D.S.O.

THE SERVICES.

ROYAL NAVAL MEDICAL SERVICE.

THE following appointments are notified:—Surg. Com. W. H. Daw to *Donegal*; Surg. Lieut.-Com. E. C. Holtom to *Bristol*; Surg. Lieut. I. S. Gabe to Royal Marine Division, Chatham.

ROYAL NAVAL VOLUNTEER RESERVE.

Temp. Surg. Lieut. H. G. Davies, R.N.V.R., who has been invalided on account of ill-health contracted in the Service, to retain his rank.

ROYAL ARMY MEDICAL CORPS.

Lieutenant-Colonels to be acting Colonels while employed as Assistant Directors of Medical Services of a Division: A. E. Hamerton, H. C. R. Hime, (Brevet Col.) G. J. A. Ormsby.

The undermentioned relinquish the acting rank of Lieutenant-Colonel on re-posting: Major W. J. Weston; Capt. W. Tyrrell.

To be acting Lieutenant-Colonels whilst in command of a Medical Unit: Capt. G. F. Rudkin, Capt. (acting Major) M. White, Capt. H. H. Leeson, Capt. (acting Major) M. J. Williamson, Major W. E. C. Lunn, Capt. (acting Major) J. B. A. Wigmore, Capt. (acting Major) G. D'R. Carr, M.C.

Lieut.-Col. F. S. Le Quesne, V.C., is placed on retired pay.

Temporary Colonels relinquishing their temporary commissions on re-posting: R. E. Kelly (Captain, R.A.M.C., T.F.), H. A. Ballance (Major, temp. Lieut.-Col., R.A.M.C., T.F.).

Lieut.-Col. J. E. Brogden is placed temporarily on the Half pay List.

To be acting Majors: Capts. B. Varvill, K. P. Mackenzie, W. E. Tyndall; Temp. Capts. A. W. P. Todd, W. K. A. Richards, D. J. Stokes, J. H. Hood, J. Rodger, D. S. Graham, D. R. Williams, C. N. Coad, A. L. Saunders, R. Felton, G. S. Brown, and D. M. Ross, and W. H. Stott while commanding troops on a Hospital Ship.

Temp. Capts. relinquishing the acting rank of Major on re-posting: R. V. Dolbey, W. D. Cruickshank, W. G. Johnston, W. K. A. Richards, R. Wilson.

J. E. Briscoe to be Captain.

Temp. Hon. Capt. H. O. Stansfield to be acting Major whilst specially employed.

Temporary Lieutenants to be temporary Captains: F. W. Daniels, S. B. Turner, D. Holroyde.

Temp. Hon. Lieut. A. C. Delacroix to be temporary honorary Captain.

Officers relinquishing their commissions:—Temp. Majors: A. H. Bindloss, J. B. Howell, Temp. Hon. Major W. C. G. Ashdowne. Temp. Capts.: G. Denholm, A. G. H. Lovell, G. N. Lorimer, T. Clarkerson, E. A. Miller, R. J. McFeeters, C. J. A. N. Mercier, C. M. Young, M. J. Ryan, W. G. B. Gunn, (Acting Major) B. H. Barton, F. J. Child, E. C. Bourdas, A. B. Aitken, C. E. Lakin, C. S. Kingston, J. A. Gray (Home Hospital Reserve), A. Westerman, A. R. Jordan, A. C. Halloes, J. B. McMorland, J. E. English, H. Dyer, A. Dingwall, T. E. Ferguson, S. Vosper, R. J. Helsby, (Acting Major) E. L. M. Hackett, W. Rolland, W. W. Livingston, J. A. Davidson, H. M. Raven, E. C. Roberts, H. P. Newsholme, A. D. Hunt, (Acting Major) W. Anderson, G. Hardwicke, F. J. Lidderdale, J. L. Cochrane, J. R. Tibbles, G. D. E. Tullis, J. B. Ferguson, (Acting Major) R. Warren, A. Currie, W. A. Young, M. J. Horgan, E. E. M. Price, W. R. Bayne, H. S. Gabb, R. F. Moore, A. F. W. Denning, H. L. Tidy, J. H. Porter (Acting Major) C. H. S. Webb, K. W. D. MacRae, N. Morris, H. S. A. Hogg, S. A. Coward, O. W. Jones, R. D. Smedley, F. P. Fisher, G. Allison, G. B. Wilkinson, R. M. Liddell, (Acting Major) W. Rankin, (Acting Major) R. H. Paramore, T. L. Wormald, F. H. Walker, (Acting Major) J. L. Gordon, S. Carter, A. J. V. McDonnell, C. R. Wills, A. Gillespie, W. H. Pallett, R. M. Soames, J. O. Skevington, T. S. Sharpley. To retain the rank of Captain: E. B. Struthers. On account of ill-health contracted on active service and to retain the rank of Captain: A. C. B. Biggs, A. H. Sinclair, D. W. Jones, (Acting Major) W. A. Rogerson. On account of ill-health contracted on active service: C. Dundee, D. C. Alexander, F. L. Brewer, H. L. Martyn. On account of ill-health and to retain the rank of Captain: A. W. F. Edmonds, J. McCartney. On account of ill-health: Temp. Hon. Capt. R. M. Blake (on ceasing to serve with the British Red Cross Society in France). J. M. Smith on account of ill-health is granted the rank of Lieutenant. Temp. Lieuts.: C. J. E. Edmonds, F. P. R. James, A. Linn, G. S. Ward, D. G. Gellatly, F. G. F. Browne, D. Davies, D. Holroyde, H. Caird, W. J. N. Todd, R. Hamer, A. L. Black, W. L. Hogan, F. W. Hobbs; Temp. Hon. Lieut. J. P. Griffin (on ceasing to serve with the British Red Cross Hospital, Netley).

Canadian Army Medical Corps.

Temporary Lieutenants to be temporary Captains: J. W. Harper, G. Leith, A. E. Kennedy, D. MacDougall, P. H. M. Nulty, G. A. Minorgan, W. E. Munro, J. E. Pritchard, E. Wershof, A. S. McCann.

Canadian Army Dental Corps.

Temp. Lieut. C. W. Smith, from Canadian Machine Gun Corps, to be temporary Lieutenant.

SPECIAL RESERVE OF OFFICERS.

Capts. F. G. Foster and S. J. V. Furlong to be acting Majors.

Lieut. J. F. Cunningham relinquishes his commission on account of ill-health.

Second Lieut. E. P. Whiteman to be Lieutenant.

TERRITORIAL FORCE.

General List.—Capt. (Brevet Major) (acting Lieut.-Col.) R. C. Dun relinquishes his acting rank on ceasing to be specially employed.

Capts. (acting Majors) J. Walker, F. W. C. Brown, and F. H. Lacey relinquish their acting rank on ceasing to be specially employed.

Major (acting Lieut.-Col.) D. G. Campbell relinquishes his acting rank on ceasing to be specially employed.

Captains to be acting Majors whilst specially employed: J. W. Thomson, J. W. Craven, J. C. Newman, R. M. Wilson.

Capt. J. W. Keay to be Major.

1st Eastern General Hospital: Major (acting Lieut.-Col.) H. A. Ballance relinquishes his acting rank and is restored to the establishment.

1st London Sanitary Company: Lieut. S. W. Wingfield to be Captain.

1st London General Hospital: Capt. P. Hamill is restored to the establishment.

TERRITORIAL FORCE RESERVE.

Lieut.-Col. W. E. Foggie, from 3rd Highland Field Ambulance, to be Lieutenant-Colonel.

Majors F. N. Grinling, W. T. Rowe, D. G. Campbell, A. C. Turner, E. E. Dyer, J. R. Garrood, B. G. Ewing, G. F. R. Smith, A. A. Gunn, from Attached to Units other than Medical Units, to be Majors.

Major (acting Lieut.-Col.) P. G. Williamson, from Attached to Units other than Medical Units, to be Major.

A. A. W. Merrick, from 3rd West Lancs. Field Ambulance to be Major.

Capts. J. R. Chalmers and C. W. Greene from 1st Home Counties Field Ambulance, to be Captains.

Capt. (acting Major) A. R. Muir, from Lowland Mounted Brigade Field Ambulance, to be Captain.

Capt. N. T. K. Jordan, from South Wales Mounted Brigade Field Ambulance, to be Captain.

Capt. (acting Major) J. G. Cooke, from Attached to Units other than Medical Units, to be Captain.

Capt. (acting Major) H. F. W. Boeddicker, from 1st South Midland Field Ambulance, to be Captain.

Capt. F. H. Lacey, from Welsh Border Mounted Brigade Field Ambulance, to be Captain.

Capt. L. A. Mackenzie, from 1st West Riding Field Ambulance, to be Captain.

Capt. A. A. Pratt, from 4th Northern General Hospital, to be Captain.

Capt. H. Stonehouse, from the 2nd Northern Field Ambulance, to be Captain.

Capt. W. J. Wilkinson, from 2nd East Anglian Field Ambulance, to be Captain.

Capt. W. Bailey-Thomson, from Notts and Derby Mounted Brigade Field Ambulance, to be Captain.

Capt. G. H. Kirby, from South Midland Casualty Clearing Station, to be Captain.

Capt. J. H. Paul, from Yorks Mounted Brigade Field Ambulance, to be Captain.

Capt. W. L. Hibbert, from Home Counties Casualty Clearing Station, to be Captain.

Capt. D. Macnair, from 2nd Wessex Field Ambulance, to be Captain.

Capt. H. N. Crowe, from 2nd South Midland Field Ambulance, to be Captain.

Capt. (acting Major) H. C. Adams, from 2nd Wessex Field Ambulance, to be Captain.

ROYAL AIR FORCE.

Medical Branch.—Major J. L. Brierley to be acting Lieutenant-Colonel while employed as Lieutenant-Colonel. The following are granted temporary commissions: As Lieutenant-Colonel: Surg.-Commander C. E. C. Stanford. As Majors: Acting Majors, R.A.M.C., W. W. Shorten, T. J. Kelly, H. H. Robinson; Staff-Surgs. R.N., F. H. Stephens, A. V. J. Richardson. As Captains (acting Majors while specially employed): Acting Majors, R.A.M.C., M. N. Perrin, J. H. Porter. As Captains: Surg. Lieuts., R.N., W. A. S. Duck, D. S. Stevenson, F. B. Gillespy, D. Ross, R. W. Meiler, A. L. Dykes, L. S. Goss, R. B. Adams, J. H. M. Sandeson, B. McLean; Surg. Lieuts., R.N.V.R., C. F. A. Hereford, T. B. Dixon, D. A. Macpherson; Capts., R.A.M.C., D'Arcy Power, J. H. Owen, A. Sutcliffe, J. M. Wyatt, F. A. Hampton, N. C. Graham, A. G. H. Smart, L. W. Shelley, C. P. Sells, E. W. Craig, W. J. McKeand, A. G. H. Moore, W. S. T. Connell, J. Freeman, G. Cranstoun, W. Waugh, C. F. Graves, D. H. Fraser, W. H. Cam, J. W. Keay, A. D. Kennedy, J. E. Lascelles, C. H. Thompson, J. E. Dunbar, V. T. Ellwood, J. H. Cooke, P. H. Young, J. Chambré, T. N. Wilthew, A. Leitch, C. K. Attlee, C. W. W. James, W. B. Dove.

G. D. M. Beaton (temporary Lieutenant, R.A.M.C.) is granted a temporary commission as Lieutenant.

Dental Branch.—As Captains: J. Barratt, G. Dawson, L. S. Woodiwis.

BOOKS, ETC., RECEIVED.

ALLEN, GEORGE, AND UNWIN, LTD., London.
A League of Nations with Large Powers. By F. N. Keen, LL.B. With Preface by the Rt. Hon. Sir W. H. Dickinson, K.B.E., M.P. 1*s.*

CHURCHILL, J. AND A., London.
Year Book of Pharmacy. Edited by J. O. Braithwaite and Others.
Sanitation in War. By Lieutenant-Colonel P. S. Lelean, R.A.M.C. 3rd ed. 7*s.* 6*d.*

HODDER AND STOUGHTON, London.
One Man's View. By L. Merrick. With an Introduction by Granville Barker. 6*s.*
How to Reduce Your Income Tax by Liberty Currency. By A. E. Sitwell. 1*s.* 3*d.*

JACK, T. C. AND E. C., London.
An Introduction to the Study of Biological Chemistry. By S. B. Schryver, D.Sc. 6*s.*

LIBRARY PRESS, London.
Physiology of Industrial Organisation and the Re-employment of the Disabled. By Professor J. Amar. Translated by A. F. Stanley Kent, D.Sc. 30*s.*

MASSON ET CIE., ÉDITEURS, Paris.
Leçons de Chirurgie de Guerre. Publiées, sous la direction de Cl. Regaud, de l'Institut Pasteur de Paris. 9 fr. (+ 10 per cent.)

UNIVERSITY PRESS, Cambridge.
Calendar for 1918–1919. 10*s.* 6*d.*

UNIVERSITY OF LONDON PRESS, London.
Regulations for External Students of the University of London. 1*s.* 6*d.*
Calendar of the University of London, 1918–1919. 1*s.* 6*d.*

YEAR BOOK PUBLISHERS, Chicago.
Practical Medicine Series. Vol. V., Gynecology. Edited by E. C. Dudley, M.D. Obstetrics. Edited by J. B. de Lee, M.D. Series 1918. $1.60.

THE position of French medical students still on active service is being considered by an Inter-Ministerial Commission over which M. Damany, méd. de 1. classe, presides.

THE LANCET, VOL. II., 1918: THE INDEX.

THE Index and Title-page to the volume of THE LANCET which was completed with the issue of Dec. 28th, 1918, is in preparation. Owing to the continued shortage in the paper-supply, the Index will not be issued with all copies of THE LANCET, as was the custom prior to the War. Subscribers who bind up their numbers are requested to send a *post-card* (which is more convenient for filing purposes than a letter) to the Manager, THE LANCET Office, 423, Strand, London, W.C. 2, when a copy of the Index and Title-page will be supplied free of charge.

Medical News.

UNIVERSITY OF ABERDEEN.—The following degrees were conferred recently:—

M.B. and Ch.B.—Patrick Stephen Gerrard Cameron, Marjory Johnston Dufton, Anne Simpson, and John Geddes Smith (second-class honours).

ROYAL SOCIETY OF MEDICINE.—The Section for the Study of Disease in Children will hold a discussion upon the Etiology, Prevention, and Non-operative Treatment of "Adenoids" at 1, Wimpole-street, on Friday, Jan. 24th, at 5 P.M. The discussion will be opened by Dr. Harry Campbell and Dr. Edmund Cautley.

WEST LONDON MEDICO-CHIRURGICAL SOCIETY.—An ordinary meeting of this society will be held to-day (Friday, Jan. 10th) in the society's rooms, West London Hospital, at 8.30 P.M., when a paper will be read by Major W. McAdam Eccles, entitled "Stumps and their After-treatment."

MEDICAL MAGISTRATE.—Dr. G. W. Eustace, ex-Mayor of Arundel, has been placed on the commission of the peace for Sussex. He was awarded the Military Cross for gallantry at Ypres in September, 1917, being then attached to the Queen Victoria Rifles. Dr. Eustace also served in the South African War, receiving the medal and three clasps.

KING EDWARD'S HOSPITAL FUND FOR LONDON.—A meeting of the General Council of King Edward's Hospital Fund for London was held on Jan. 6th at the offices of the Fund, 7, Walbrook, E.C., the Right Hon. James W. Lowther, M.P. (Speaker of the House of Commons), in the chair, when the order of appointment to the council, committees, and executive was read, and the resolutions providing for the work of the Fund for 1919, approved by the governors on Dec. 17th last, were formally adopted.

KING GEORGE'S FUND FOR SAILORS.—At a meeting of the general council of this fund, which was held at Trinity House on Dec. 20th last, it was announced that £50,000 had been allocated to the Marine Benevolent Institutions. The fund has for its object the amelioration of distress among seamen and their dependents, and letters were read at the meeting from the King and other members of the Royal Family expressing their gratification at the success of the fund and their appreciation of the generous response on the part of the public, both in this country and in the dominions and colonies. His Majesty expressed the wish that next year the donations might reach a total of £1,000,000.

UNIVERSITY OF EDINBURGH.—The following medical items from the annual report for 1917–18 are of interest:—

During the academic year 1917–18 the total number of matriculated students was 2091, of whom 1339 were men and 752 were women. Of these there were enrolled in the Faculty of Medicine 1147 (823 men and 324 women—an increase of 84 upon the number of women for the previous session). Of the students of medicine, 583, or over 51 per cent., belonged to Scotland; 199, or over 17 per cent., were from England and Wales; 76 from Ireland; 299, or 26 per cent., from British Dominions, Colonies, and Dependencies of whom 76 came from India and 25 from foreign countries. The following medical degrees were conferred:—Bachelor of Medicine and Bachelor of Surgery 106, Doctor of Medicine 15. The total annual value of the University fellowships, scholarships, bursaries, and prizes now amounts to about £21,485, of which £5610 belongs to the Faculty of Medicine. The coming of peace has already brought back many former students, and others have entered the commencement of whose course had been delayed by military service. When the spring term opens there will be a further large augmentation of numbers in all departments of study. The University authorities are addressing themselves to the various problems which lie ahead, and it is hoped that, alike by some reasonable relaxation of preliminary requirements and by the provision of courses of instruction adapted to the special needs of the time, the case of the returning student will be adequately and even generously dealt-

with. The University of Edinburgh, in common with the other universities of Great Britain, has drawn up a statement of its most pressing financial needs, and it is anticipated that the Government will supplement their existing grants to some extent. Two vacancies have occurred during the year in the ranks of the professoriate, one by resignation, the other owing to death. Sir Thomas Fraser resigned, as from the end of September, the chair of materia medica, which he had held for 41 years, adding lustre to the University during this long period, not less by the importance of his scientific investigations than by his success as a teacher. He has been succeeded by Mr. A. R. Cushny, who was formerly professor of materia medica and pharmacology in the University of London. The deaths of two University lecturers are recorded—viz., Dr. W. G. Smith, who was appointed to the George Combe Lectureship in Psychology on its institution in 1906, and who, in spite of indifferent health, discharged the duties devolving upon him with exceptional competence and devotion; and Mr. Denis Cotterill, one of the lecturers in clinical surgery, who for several years rendered services of the highest value in connexion with No. 11 Hospital, Rouen. Sir William Watson Cheyne, Bart., K.C.M.G., has been elected as one of the three Parliamentary representatives for the universities of Scotland. Among the benefactions is a bequest by the late Dr. Grace R. Cadell, to the University, jointly with the Edinburgh Hospital for Women and Children and Hospice, of the residue of her estate; the moiety falling to the University being "to help in the medical education of women in that University."

Lord Ashton, of Ryelands, Lancaster, has sent to the Preston Royal Infirmary a cheque for £2000 to free the institution from debt.

THE subscriptions to the French War Medical Assistance Fund have reached a total of more than a million francs. This fund also makes grants to the families of medical men. Its address is 5 rue de Surène, Paris.

UNIVERSITY OF LONDON.—Dr. John W. H. Eyre (Guy's Hospital Medical School) has been appointed professor of bacteriology, and Dr. Arthur E. Boycott, F.R.S., has been reappointed director, and Dr. C. Bolton, F.R.S., acting director, of the Graham Legacy Laboratory, during Dr. Boycott's absence on military duty.—In coöperation with the London County Council the University has arranged a series of five lectures for teachers on "Surgery, Ancient and Modern, with special reference to Lister and Pasteur," which will be delivered by Sir Rickman J. Godlee at University College on Wednesdays, at 5.30 P.M., beginning on Jan. 22nd. Sir Cooper Perry will preside at the opening lecture.

Communications, Letters, &c., to the Editor have been received from—

A.—Surg.-Lieut. A. L. Abel, R.N.; Messrs. Abdulla and Co. Lond.; Major G. L. Arnold, R.A.M.C.; Army Medical Service, Lond., Director-General of.

B.—Dr. R. F. Buzzard, Lond.; Dr. C. Burland, Blundellsands; Messrs. Butterworth and Co. (India), Ltd., Calcutta; Lt.-Col. H. W. Bayly, R.A.M.C.(T.); Mr. J. L. Balderston, Lond.; Dr. A. G. Bateman, Lond.; Capt. T. G. Brown, Lond.; Birmingham, Medical Officer of Health of; Surg.-Capt. P. W Bassett-Smith, C.B., C.M.G., R.N.; Mr. E. A. Barton, Lond.; Dr. C. Bose, Calcutta.

C.—Dr. F. G. Crookshank, Lond.; Canadian War Records, Officer in Charge of, Lond.; Mrs. R. M. Corbett, Beaconsfield; Mr. F. Coca, Madrid; Mrs. M. Comber, Lympstone; Dr. A. J. Chalmers, Khartoum; Mr. J. Cabburn, Lond.

D.—Domestic Engineering Co., Lond.; Decimal Association, Lond.; Dr. J. N. Dyson, Eastbourne; Dr. I. David, Colombo; Dr. W. F. Dearden, Manchester.

E.—Mr. L. Emery, Leysin; Dr. Elliston, Porthleven.

F.—Dr. J. D. Ferguson, Scarborough; Factories, Chief Inspector of, Lond.

G.—Capt. J. Geoghegan, R.A.M.C.; Dr. W. R. Grove, St. Ives; Dr. H. L. Gordon, Lond.; General Medical Council, Lond., Registrar of.

H.—Mr. T. G. Hill, Lond.; Fleet-Surg. W. E. Home, R.N.

J.—Mr. F. Jenner, Boscombe; Mr. R. R. James, Lond.; Lt.-Col. A. L. Johnson, C.A.M.C.

K.—Dr. W. Kidd, Lond.; Rt. Hon. Lord Kinnaird, Lond.; King Edward's Hospital Fund for London, Hon. Secs. of; Dr. A. M. Kennedy, Glasgow; Mr. O. H. Kahn, Boston.

L.—Dr. R. E. Lord, Colwyn Bay; Major G. C. Low, Lond.; Local Government Board, Lond.

M.—Ministry of National Service, Lond., Sec. of; Dr. I. Moore, Lond.; Dr. J. C. McWalter, Lond.; Mrs. J. T. McEntire, Dublin; Lt.-Col. C. S. Myers, R.A.M.C.; Mr. G. Mayall, Bolton; Medical Research Committee, Lond.; Mr. J. Y. W. MacAlister, Lond. Dr. R. Morton, Lond.

N.—Capt. H. L. C. Noel, R.A.M.C.

P.—Mr. F. H. Perrycoste, Polperro; Mr. R. D. Pedley, Lond.; Dr. A. Powell, Bombay.

R.—Royal Microscopical Society, Lond; Royal Institution of Great Britain, Lond.; Mr. S. Rowntree, York; Royal Institute of Public Health, Lond.; R. S.; Dr. H. Rahmet Bey, Cairo; Mr. P. B. Roth, Lond.; Mr. H. M. Rainsford, Lond; Dr. Reynolds, Lond.; Dr. N. Raw, Lond.; Royal Society of Arts, Lond.

S.—Mrs. J. Simpson, Lond.; Sir G. H. Savage, Lond.; Dr. W. C. Swayne, Clifton; Sir Stewart Stockman, M.R.C.V.S., Lond.; Mr. B. Slopee, Lond.

T.—Mr. D. R. Thom, Aberdeen.

U.—University of Edinburgh, Sec. of.

W.—Capt. A. H. Watson; Mr. C. B. West, Lond.; Capt. A. Wylie, R.A.M.C.; Major C. F. White, R.A.M.C.; Dr. F. P. Weber, Lond; Mr. W. C. Whitworth, Scarrier; West London Medico-Chirurgical Society; Mr. A. Watkins, Hereford; Wallace Automatic Disinfecting and Deodorising Co., Lond.; West London Hospital Post-Graduate College, Dean of.

Y.—Dr. R. A. Young, Lond.; Capt. F. W. B. Young, R.A.M.C.(T.)

Communications relating to editorial business should be addressed exclusively to The Editor of THE LANCET, 423, Strand, London, W.C. 2

Medical Diary for the ensuing Week.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.1.

Tuesday, Jan. 14th.

GENERAL MEETING OF FELLOWS, at 5 P.M.

Discussion:

On "Conditions under which Pensioners of the Army, Navy, and Royal Air Force are Admitted into and Treated in Civil Hospitals," to be opened by Mr. H. J. Waring. Any Fellow wishing to take part in the Discussion should send his name to the Secretary as soon as possible.

MEETINGS OF SECTIONS.

Tuesday, Jan. 14th.

PSYCHIATRY (Hon. Secretaries—Bernard Hart, G. F. Barham): at 3.30 P.M.

CLINICAL MEETING at the Ewell War Hospital by courtesy of Lt.-Col. M. A. Collins, R.A.M.C., D.D.M.S. Eastern Command, and of the Committee, L.C.C.

Train leaves Waterloo at 2.37 P.M., arriving Ewell 3.10 and Epsom 3.15. Return train leaves Ewell at 5.59 P.M. for Waterloo.

Wednesday, Jan. 15th.

HISTORY OF MEDICINE (Hon. Secretaries—Charles Singer, Arnold Chaplin): at 5 P.M.

Papers:

Sir William Osler: A Bodley MS. of Lectures of Andrea Cæsalpinus, 1590.

Dr. Cumston: A Contribution to the History of the Surgical Treatment of Aneurysm, from notes of Dr. Charles Maunoir of Geneva, made in 1802.

Thursday, Jan. 16th.

DERMATOLOGY (Hon. Secretary—S. E. Dore): at 4.30 P.M.

Cases will be shown.

Friday, Jan. 17th.

OTOLOGY (Hon. Secretaries—J. F. O'Malley, H. Buckland Jones): at 5 P.M.

Paper:

Mr. Hugh E. Jones (President of the Section): Deafness associated with the Stigmata of Degeneration.

ELECTRO-THERAPEUTICS (Hon. Secretaries—Robert Knox, Walter J. Turrell): at 8.30 P.M.

Adjourned Discussions on the following Papers:—

A Note on the Construction of the Diathermy Machine (with demonstration): by C. M. Dowse, B.Sc., and C. E. Iredell, M.D.

Diathermy in Gynæcological Cases: by G. Bellingham Smith, F.R.C.S., C. E. Iredell, M.D., and A. E. Marsden, Surgeon, R.N.

Personal Experiences of Burning due to Secondary Radiation; by James Metcalfe, M.D.

Diathermy and Fulguration in Malignant Disease: by Philip Turner, F.R.C.S., Lt.-Col., R.A.M.C., and C. E. Iredell, M.D.

Papers:

Diathermy in Diseases of the Eye: by C. Meadows Ryley, Surgeon, R.N., and C. E. Iredell, M.D.

The Diathermy of the Abdomen: by C. E. Iredell, M.D., with a Note by W. H. Barber, M.D., Captain, R.A.M.C.

Dr. S. Gilbert Scott will show lantern slides of interesting cases.

CLINICAL

OBSTETRICS AND GYNÆCOLOGY

SURGERY: Members of these Sections are specially invited to attend the Meeting of the Section of Electro-Therapeutics.

The Royal Society of Medicine keeps open house for R.A.M.C. men and M.O.'s of the Dominions and Allies. The principal hospitals in the metropolis admit medical officers to their operations, lectures, &c. Particulars on application to the Secretary at 1, Wimpole-street, London, W.1.

SOCIETY OF TROPICAL MEDICINE AND HYGIENE, 11, Chandos-street, Cavendish-square, W.

FRIDAY, Jan. 17th.—5.30 P.M., Paper:—Lt.-Col. S. P. James, I.M.S. (retd.): Malaria in England.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.

Clinics each week-day at 2 P.M., Wednesday, Friday and Saturday also at 10 A.M.

(Details of Post-Graduate Course were given in issue of Nov. 30th, 1918.)

ST. JOHN'S HOSPITAL FOR DISEASES OF THE SKIN, 49, Leicester-square, W.C.

TUESDAY, Jan. 14th.—5 P.M., Dr. W. K. Sibley: Ionisation.

WEDNESDAY.—5 P.M., Dr. W. Griffith: Skin Diseases in the Army.

ROYAL INSTITUTE OF PUBLIC HEALTH, in the Lecture Hall of the Institute, 37, Russell-square, W.C.

Course of Lectures and Discussions on Public Health Problems under War and After-war Conditions:—

WEDNESDAY, Jan. 15th.—4 P.M., Prof. W. A. Bone: Coal and National Health.

THE King has conferred the Order of Mercy on Lieutenant-Colonel R. R. Sleman, R.A.M.C.

CLASSES in the various faculties were resumed in the University of Lille on Jan. 3rd. The Faculty of Medicine in Brussels reopens its doors in the course of the month.

Appointments.

ALFORD, H. J., M.D. Lond., has been appointed Consulting Medical Officer of Health and School Medical Officer to the Taunton Town Council.

BULLOUGH, WILLIAM A., M.B., Ch.B., County Medical Officer of Health for Essex.

WILLIAMS, A. H., M.D. Edin., Commissioner of Medical Services for the North-West Region, which includes the whole of Lancashire and Cheshire.

Vacancies.

For further information refer to the advertisement columns.

Aylesbury, Bucks County Asylum.—Asst. M.O. £350.
Birmingham, St. Chad's Hospital.—Res. M.O. £150.
Bath Royal United Hospital.—H.P. and H.S.
Bedford County Hospital.—Res. Clin. Asst. £2 2s. per week.
Bolingbroke Hospital, Wandsworth Common, S.W.—Res. M.O. £200.
Bradford Royal Infirmary.—H.S.
Bristol General Hospital.—Sen. H.S. £30.
Chichester, Royal West Sussex Hospital.—H.S. £160.
Dorchester, Dorset County Asylum.—Second Asst. M.O. £300.
Dudley County Borough.—M.O.H. and School M.O., &c. £750.
East Ham County Borough.—Female Asst. M.O. £400.
East London Hospital for Children and Dispensary for Women, Shadwell, E.—Asst. Res. M.O. £125. Also Casualty Officer. £120.
Edinburgh, Venereal Diseases Scheme.—Female Asst. M.O. £400.
Exeter City Mental Hospital, Digbys, near Exeter.—Asst. M.O. £300.
Glamorgan County Asylum, Bridgend.—Temp. Asst. M.O. £6 6s. per wk.
Great Northern Central Hospital, Holloway-road, N.—H.S. £150.
Guildford, Royal Surrey County Hospital.—H.S. £250.
Hellingly, East Sussex County Asylum.—Temp. Asst. M.O. 7 gs. per wk.
Hull City Education Committee.—Asst. Female School M.O. £400.
Hospital for Consumption and Diseases of the Chest, Brompton.—H.P. 30 gs.
Manchester, Ancoats Hospital, Mill-street.—Hon. P.
Margate, Royal Sea Bathing Hospital for Surgical Tuberculosis.—S. £200.
Monmouthshire County Council.—Female Asst. M.O. £400.
North Riding Asylum.—Locum Tenens M.O. 7 gs. per week.
Northampton County Borough.—Temp. Tuberc. Officer. £400.
Norwich Norfolk and Norwich Hospital.—H.P. £250. Hon. P.
Putney Hospital, Lower Common, S.W.—Res. M.O. £150.
Queen's Hospital for Children, Hackney-road, E.—Temp. Asst. P.'s. £25.
Queen Mary's Hospital for the East-End, Stratford, E.—M.O.
Reading, Royal Berkshire Hospital.—Hon. P.
Rochdale Infirmary and Dispensary.—Jun. H.S. £100.
Rochester, St Bartholomew's Hospital.—Clin. Asst. £150.
Rotherham Hospital.—Sen. H.S. £250.
Royal Free Hospital, Gray's Inn-road, W.C.—H.P. £50. Casualty H.S. £100.
Surrey Education Committee.—School Dentist. £300.
Swansea Hospital.—Res. Senior Student. £150.
Swindon Borough.—Asst. M.O.H. £500.
Victoria Hospital for Children, Tite-street, Chelsea, S.W.—H.P. and H.S. £200.
Westmorland Sanatorium, Meathop, Grange-over-Sands.—Asst. M.O. £300.
Whitehaven and West Cumberland Infirmary.—Res. H.S. £150 to £180.

THE Chief Inspector of Factories, Home Office, S.W., gives notice of vacancies for Certifying Surgeons under the Factory and Workshop Acts at Knutsford, Folkestone, Blackburn, Preston, and Harrogate.

Births, Marriages, and Deaths.

BIRTHS.

GRATTAN-GUINNESS.—On Dec. 30th, 1918, at Madeley, Shropshire, the wife of Dr. A. F. Grattan-Guinness of a daughter.

MOYLE.—On Jan. 2nd, at Church Hill House, Stalbridge, Dorset, the wife of H. H. Moyle, M.R.C.S., L.R.C.P., of a daughter.

MARRIAGES.

CRILE—WEBB.—On Jan. 1st, at Haslemere, Captain Dennis Crile, R.A.M.C., Harvard Unit, to Mary Dorothea, elder daughter of Major and Mrs. H. N. Webb, of Wakenills, Haslemere.

HALL—ROUTLEDGE.—On Jan. 1st, at St. John's, Holland road, W., Robin Hall, M.B., B.Ch., B.A.(Oxon.), Captain, Royal Air Force, elder son of Dr. and Mrs. Robert Hall, of Belfast, to Geraldine Elsie, only daughter of Mr. and Mrs. Gerald Edmund Routledge, of Kensington, W.

STRINGER—GRANT.—On Jan. 1st, at St. James's, Freiston, Louis Bruce Stringer, Captain, R.A.F. Medical Service, to Maud, third daughter of Mr. and Mrs. John Grant, of Freiston, Boston, Lincolnshire.

DEATHS.

ELLIS.—On Jan. 2nd, in London, William Ashton Ellis, M.R.C.S., L.R.C.P.

HERRIOT.—On Dec. 31st, 1918, at Leamington, in a Nursing Home, Stuart Herriot, M.B., L.R.C.S. Edin., aged 60.

MACKINNON.—On Dec. 30th, 1918, at Alexandria, of pneumonia, Frank I. Mackinnon, M.B., C.M., M.R.C.S. (of Damascus), Captain, R.A.M.C. (temporary), aged 63.

N.B.—A fee of 5s. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Short Comments, and Answers to Correspondents.

COLONIAL HEALTH REPORTS.

Ceylon.—It appears from the Blue-book for 1917 that the population at the end of that year was estimated at 4,632,400. This showed a net increase of nearly 85,000 over that of the previous year, and was made up of an excess of about 70,590 births over deaths, of 15,180 arrivals over departures of Indian coolies, and of a reduction of nearly 270 persons of the European population who left for war service. The following are details of the population:—

Nationality.	No.	Percentage of total population.	Nationality.	No.	Percentage of total population.
Sinhalese ...	2,951,100	... 63·7	Malays ...	14,000	... 0·3
Tamils ...	1,338,100	... 28·9	Europeans ...	7,200	... 0·2
Moors	276,650	... 5·9	Others... ...	16,000	... 0·4
Burghers ...	28,750	... 0·6			

To every 100 males of the population there are 89 females. The birth-rate was 40·1 per 1000 of the population, and was 2·6 higher than the average of the preceding decennium. It was the second highest on record, being 0·9 below that of 1908, which was the highest. The proportion of male to female births was 104 to 100. The death-rate was 24·7 per 1000, the lowest recorded during the last 10 years. The proportion of male to female deaths was, like the proportion of births, 104 to 100. Of the total deaths registered during the year 28·2 per cent. were those of infants under 1 year of age, corresponding to a mortality-rate of 174 per 1000 births registered. This rate is 20 per 1000 below the average for the preceding decennium, and 10 per 1000 below that for 1916. The proportion of deaths in the general community from certain principal causes to a million of the estimated population was as follows: Infantile convulsions, 2814; diarrhœa, 2217; pneumonia, 1090; phthisis, 821; dysentery, 666; ankylostomiasis, 575; puerperal septicæmia, 401; premature birth and congenital defects, 349; malaria and malarial cachexia, 278; bronchitis, 189; cancer, 92; and enteric fever, 91. Plague, which broke out in Ceylon for the first time in 1914, is still continuing its scourge, having claimed as its victims in the year under review 211 persons, against 286 in 1916. Accidental drowning accounted for 95 deaths per million population, falls from trees for 83, and snake-bite for 46. 240 deaths (including 2 Europeans) resulted from suicide, homicide accounted for 183, and 38 were due to judicial hanging. That the reduction in the number of plague cases during 1917 was in no way due to the virulence of the infection having abated is indicated by the steady rise in the case mortality, which was 92·2 per cent. in 1914, 92·8 in 1915, 93·8 in 1916, and 94·7 in 1917. As hitherto, the largest number of cases occurred amongst young adults, males being attacked more frequently than females. The disease was, as usual, almost entirely confined to the occupants of insanitary tenements. Out of a total of 23,382 rats examined bacteriologically, only 70, or 0·3 per cent., were infected, by far the largest number being found in an area which is the chief centre of the petty trade in grain. It is of special interest to record that three out of six cats examined were found to be heavily infected. The same preventive measures as hitherto were carried out, reliance being placed chiefly upon isolation of patients in hospital, segregation of contacts, evacuation and closure of insanitary tenements in infected localities pending the carrying out of structural improvements by the owners, pesterining of infected and adjacent houses, sulphur fumigation of rat tunnels, capture and poisoning of rats. The campaign against ankylostomiasis, which is extremely prevalent in practically every part of the island, was carried on throughout the year by officers of the International Health Commission, whose work is much appreciated, in conjunction with the medical department. There are 84 Government hospitals and 441 Government outdoor dispensaries. The owners of private estates have provided 58 estate hospitals and 401 dispensaries. Three new hospitals were opened during the year and several others are under construction. The lunatic asylum contained on Dec. 31st, 1917, 1030 inmates. The leper asylum, situated six miles from Colombo, contained 429 patients at the end of the year. A smaller establishment for lepers exists at Kalmunai, in the Eastern Province, with accommodation for 30, and a leper colony at Mantivu, a small island on the lagoon in the neighbourhood of Batticaloa, is being erected. A Home for Incurables (containing 80 beds) is administered by a committee of Government officials and representatives of the public. The general rebuilding scheme in contemplation for the improvement of the Medical College was deferred owing to the war. The full course of training for medical

students is five years. A diploma in medicine, surgery, and midwifery (which can be registered in the United Kingdom), is granted to successful medical students. A two years' course of training is provided for apothecaries, who, on becoming qualified, are employed by Government. The attendances during 1916 and 1917 totalled—medical, 620; apothecary, 253: the passes were—medical, 30; apothecary, 30. In Colombo there are a bacteriological institute, a general hospital, an ophthalmic hospital, a lying-in home, a hospital for women and children, and one for infectious diseases. There is an establishment for the manufacture of calf lymph, and at Kandy and Galle there are special dispensaries for the treatment of eye diseases. An antituberculosis institute in Colombo was opened during the year, fitted with an up-to-date X ray apparatus. A start was also made in connexion with the provision of a Pasteur Institute in Colombo.

ELECTROLYTIC DISINFECTANT IN INFLUENZA.

IN view of the Memorandum on Epidemic Influenza which has been issued by the Royal College of Physicians of London (THE LANCET, Nov. 16th, 1918), in which, as a preventive, is recommended gargling the throat with 20 drops of solution of chlorinated soda in a tumbler of warm water and sniffing up the nose a solution of common salt, Mr. F. W. Alexander, medical officer of health of Poplar, sends us an account of the method adopted in that borough for dealing with the outbreak. The drawbacks to using chlorinated soda on a large scale are that it is difficult to make and has to be freshly prepared. The electrolytic fluid as made in Poplar contains common salt and hypochlorite of magnesium (a solution of chlorinated magnesium), it is alkaline and stable, and if it is necessary to give it a tint permanganate of potash may be used for the purpose, as it retains its colour when added to the solution. During the first three weeks of November 5370 gallons were distributed free in the borough, the cost, including that of electricity and materials, being ½d. per gallon (or about £12 per 5370 gallons). This fluid has been available free in Poplar for the last 12 years, and as soon as influenza broke out in the borough handbills were distributed and the district posted with bills instructing the inhabitants to rinse the mouth, gargle the throat, and douche the inside of the nose with the council's electrolytic disinfectant, which could be procured free at one of the council's seven distributing depôts. Mr. Alexander points out the advantages of installing plants for making the fluid, especially on ships and at seaside towns, where the electrolyte is always at hand and always ready. It could be used immediately in outbreaks of diphtheria and cerebro-spinal fever.

OIL OF CHENOPODIUM FOR ANKYLOSTOMIASIS.

IN the Colonial Health Report from Ceylon, which we notice on page 89, the extreme prevalence of ankylostomiasis in that island is noted. A note in the current number of the *Colonial Journal* quotes a report from the Fiji Islands stating that the employment of the oil of chenopodium, or American wormseed oil, is constantly increasing there. The reasons given for the use of this drug are that it is less toxic, more efficient, less costly, and has a greater effect upon the ascarides associated with hookworms than thymol. Failure to obtain good results with the oil of chenopodium is claimed to be due to small dosage, the correct amount being as follows: Over 60 years of age, 20 m or 40 drops; 21 to 60 years, 30 m or 60 drops; 11 to 20 years, 20 m or 40 drops; under 10 years, 3 drops for each year of age; pregnant women, 18 drops. The doses are divided into two equal parts, one to be given at 7 A.M. and the other at 9 A.M., these being preceded by a dose of well-diluted magnesium sulphate on the afternoon of the day before treatment with the oil is begun. Two hours after the last dose of oil a second dose of the salts solution is given. A report based on the first 1000 cures occurring in Fiji states that of those receiving two treatments 70 per cent. or more are cured. In a few selected parts where the people were obedient to advice in regard to diet the cures after two treatments reached 85 per cent. Of the 1000 cures obtained in the first three months of active work, 801 occurred after two treatments, 184 after four treatments, and the remaining 15 cures after five treatments. No untoward results have been reported from the use of the drug.

HEALTH TEACHING.

THE importance of right training in hygiene, especially at school age when the future citizen is under control for training, was admirably discussed in his first Milroy lecture last year by Professor H. R. Kenwood and reported in THE LANCET of May 11th. In this connexion the health and temperance syllabus drawn up for the Natal Education Department by its medical officer, Dr. A. B. MacArthur Thomson, for the instruction of hygiene in elementary schools, is of interest, for it is a genuine attempt to introduce practical instruction in place of a pseudo-scientific method of teaching. The syllabus is graded to suit the various Standards I. to VI., and includes, in addition to the usual subjects of food, air, and cleanliness, instruction in first-aid. In Standard V. reproduction is discussed by means of vegetable physiology, the study and development of the chick taking its place in Standard VI. The great feature of the syllabus is the application of the lessons where possible by means of inspections, drills, and parades, the senior standard studying the seasonal prevalence of disease in environment, and making visits to museums to view appropriate models. Senior health monitors are also appointed to report on the sanitation of the school grounds. Precept and practice thus go hand-in-hand. Another commendable feature of the scheme is the telling of stories dealing in a general way with the triumphs of hygiene, such, for instance, as the construction of the Panama Canal.

THE METROPOLITAN WATER-SUPPLY DURING JULY, AUGUST, AND SEPTEMBER, 1918.

ALTHOUGH the mean rainfall during the month of July at 12 stations which have been selected as giving equal representation for all parts of the Thames Basin was 2·06 inches above the average mean rainfall for that month during the previous 35 years, the raw river waters showed an improvement in quality judged by chemical examination, but all three raw waters (Thames, Lee, and New River) contained more bacteria than their respective averages for the year 1917. The filtered waters likewise improved in chemical respects, while bacteriological examination yielded, generally speaking, not unsatisfactory results. There were no typical *B. coli* found in 75·3, 43·5, and 74·8 per cent. of the filtered water samples derived from the Thames, Lee, and New River water respectively, even when 100 c.cm. were examined. In August, on the other hand, the rainfall was 1·47 inch, being 1·17 of an inch below the average mean rainfall for that month during the previous 35 years. Though in some particulars not maintaining the chemical quality of the previous month, all three raw river waters yielded results better than their respective averages in 1917, and the same condition is recorded as regards the filtered waters, except that the colour showed less satisfactory results in the case of the New River and Lambeth supplies. There were more bacteria present in the raw water from the Thames and Lee than in 1917, but the bacteriological results of the filtered waters were satisfactory. September was a relatively wet month, the rainfall being 5·86 inches, which is 3·91 inches above the mean average rainfall for that month during the previous 35 years. All three raw waters showed, generally speaking, a deterioration in quality according to chemical examination, but the filtered waters maintained their quality on the whole. The Lee and New River raw waters contained more bacteria than their respective averages for the year 1917, but raw Thames water contained fewer compared with the same period. All filtered waters as they reach the consumer gave satisfactory bacteriological results.

THE "ARELLANO" INFLUENZA MASK.

PARTICULARS are given in our advertisement columns this week of the "Arellano" influenza mask, named after its designer and made by Messrs. John Bell, Hills, and Lucas, Ltd., who were so successful as manufacturers of the poison-gas respirators used in the field by H.M. forces. The Arellano mask has been approved by medical men for its purpose, and will be placed immediately, in large quantities and at a low price, on the market. Our readers know that the use of masks has been suggested as a precaution in more than one quarter during the recent epidemic of influenza.

KHAKI MONOTONY.

"A wearer of khaki," a medical man, who "craves for a little colour" and who believes that "bright colours cheer us on our way through life," calls our attention to the monotony and sombre hue of khaki, and thinks that after more than four years of war the prevalence of this dim tint has a malign influence. There can be no doubt as to the influence of colour on the mind of the savage and of the sophisticated, though the psychological effects may differ in depth and quality, but whether it would really dispel any existing depression caused by the war if, when public and State ceremonials call for military escorts and processions, the soldier appeared in full dress uniform we are not so sure as our correspondent. Probably there are plenty of uniforms stored away which could become available at short notice, so that the authorities could comply with the suggestion without much public expense, but we are not convinced of the utility of doing so. With regard to military displays, and it is to these that our correspondent specially refers, it should be remembered that for the men taking part in them full dress uniform is not the most comfortable in which to remain often for long hours and perhaps with inadequate opportunities for food.